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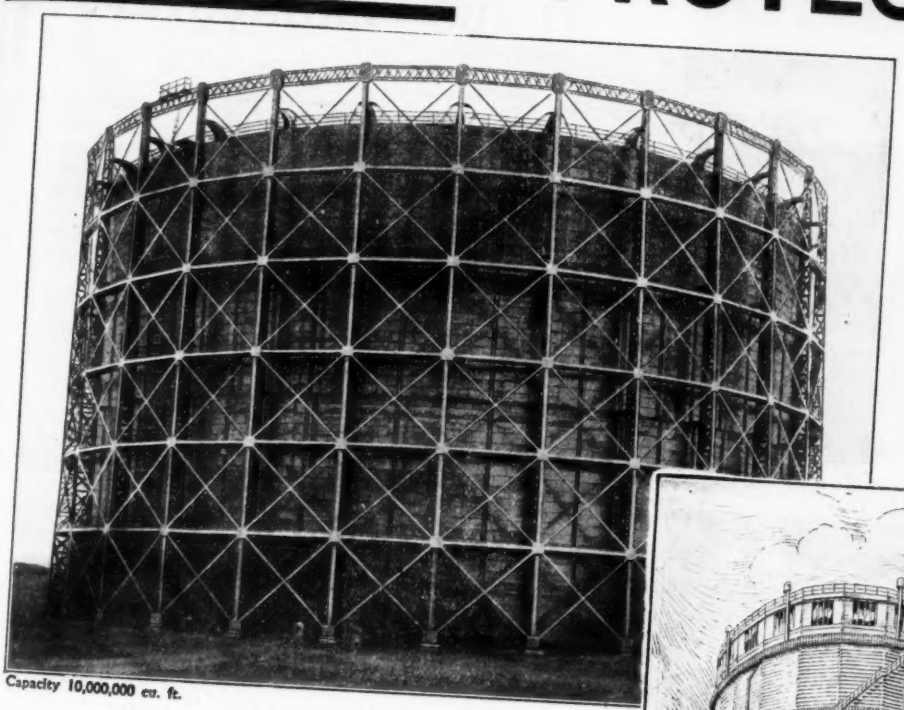

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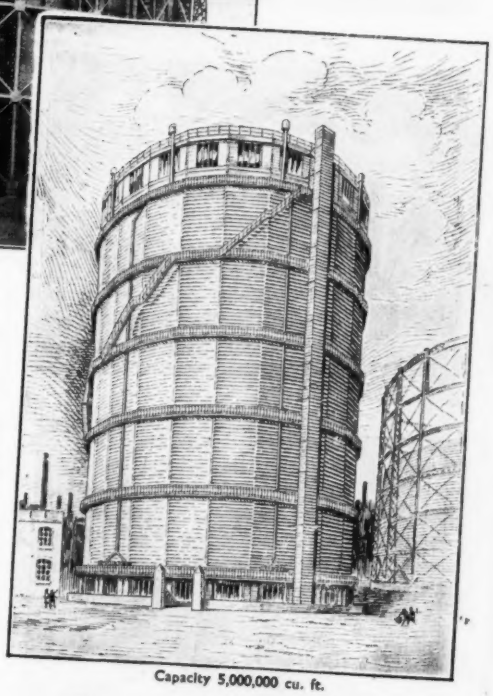

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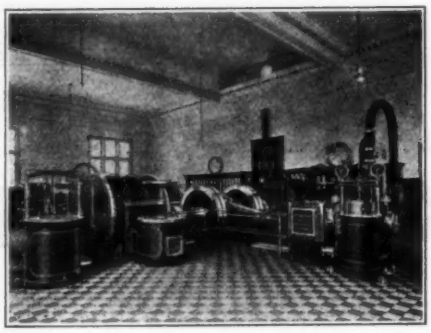

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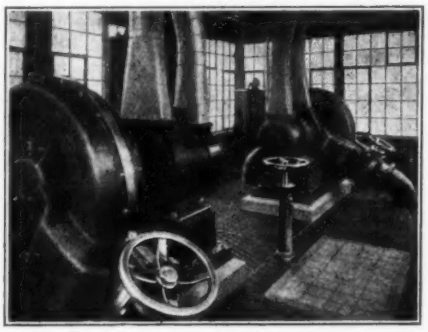

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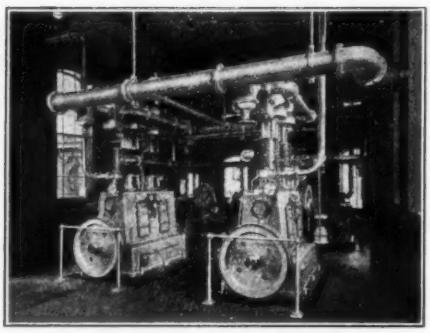

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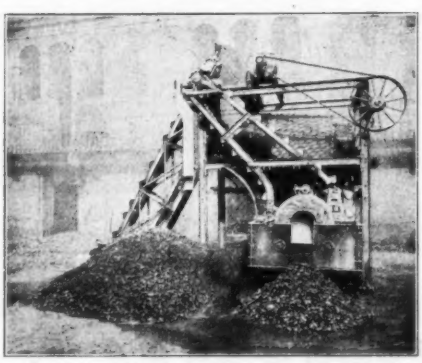

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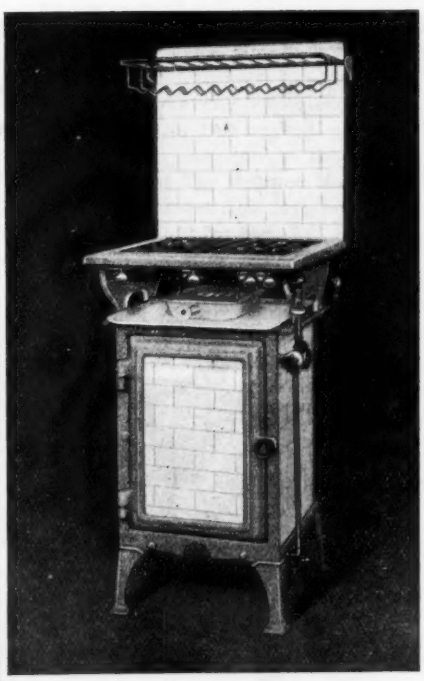

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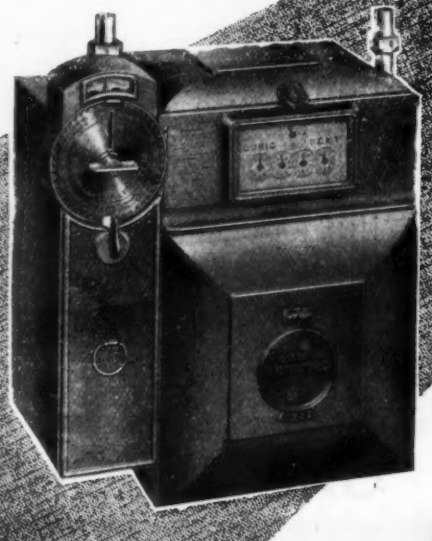

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Gas Journal

MARCH 27, 1935

Vol. 209. 87th Year No. 3749.

Editorial Notes

Sales and C.V.

VIEWING the affairs of the Gas Industry, Mr. A. L. Jennings, in his Presidential Address to the Manchester District Association of Gas Engineers last Friday, touched upon several important questions which to-day are exercising the minds of gas executives, and incidentally he gave sufficient information to indicate that the Spenborough Gas Department is a live concern. As an example of this there is the elasticity in charging for gas consumed; the rates offered are such as to encourage the consumer to extend the use he makes of gas service. For domestic purposes there is a substantial drop in price after the first 18 therms per quarter, which provides great inducement to the consumer to burn more gas. For central heating and storage circulating water systems gas is supplied at 4d. a therm, while for industrial and commercial purposes gas at 3·6d. a therm affords great scope. Mr. Jennings mentions that there is under discussion the appointment of an industrial salesman. With such obvious opportunities the decision in this regard ought not to be long delayed. In setting out with admirable brevity some of the salient features of the methods employed by his Department, Mr. Jennings states: "Quality. Declared 450 B.Th.U. Supplied 460." This appears to us totally unwarranted generosity. We cannot think why he regards 33,500 therms as non-revenue producing. We base this figure on the sales of gas during the last financial year. Nor can we think there is any psychological merit in the plan, for the consumer cannot appreciate that he is getting more than he is paying for. We should welcome Mr. Jennings' explanation why he does not supply gas of the same calorific value as that declared.

On the subject of holding companies, what Mr. Jennings has to say is very much to the point. Discussing the activities of financiers in the amalgamation of sometimes adjacent, but often distant and isolated, undertakings, he rightly emphasizes that the only justification of this new movement is better service to the consumer. As we remarked in these columns last week, the Gas Industry will always stand or fall by public opinion —the goodwill or otherwise of its millions of consumers. Obviously, then, those who are now controlling its destiny must put first and foremost the confidence of the public. Anything which tends to undermine this confidence will have a swift and unpleasant reaction. Any grouping should be "gas-minded," not an excuse for an investment of surplus funds at a price which the consumer may have to pay.

Mr. Jennings remarks that the interest of the Juniors in the area covered by the Manchester Association is a record of which the Association is justly proud. At the last meeting, for instance, 49 students were presented with Higher Grade Certificates and one student with a Diploma in Gas Engineering. He suggests, however, that a far greater number of students should avail themselves of the educational facilities afforded, and to this end he asks for simplification of the Education Scheme Regulations. Regulations of the kind must of necessity be somewhat complicated, but we cannot think that generally the Scheme as now formulated, after many modifications and much thought and experience, is so very difficult to follow. And in this regard we would call attention to the simple explanation of the Scheme given by Mr. John Terrace at the Annual Meeting of the British Commercial Gas Association last September and published in the "JOURNAL" for Oct. 3, 1934. Mr. Terrace approached the subject from the point of view of the potential student and his chief, so that each might gather sufficient information for his initial purpose of deciding what courses would be most suitable for any particular case. From the information given clearly and concisely by Mr. Terrace the student should be able to learn how certificates already acquired affect the course and the extent of his further studies, and provide his chief with a general knowledge of the Scheme without the details of the regulations. In plain language and without any frills or unnecessary details of regulations, Mr. Terrace set out what the I.G.E. Education Scheme requires; and we suggest that busy gas engineers should refer to that statement.

A New Name Needed

"COMPLAINTS" should be welcomed rather than suppressed, and, at the outset at any rate, should be treated on their face value and given unprejudiced attention and examination. With this idea, which is mentioned by Mr. Cureton, of the Birmingham Gas Department, in this month's "GAS SALESMAN," we are in thorough agreement, for it is by no means uncommon for an exaggerated or unreasonable complaint to be the outcome

of a feeling of injustice left by a past incident which may have no relation to the immediate matter under consideration. What we disagree with, however, is the tendency of undertakings to advertise " complaints " to the outside world. There is something psychologically unsound in the setting-up of a " complaints " department. We quarrel not with the idea but with the designation. A complaints department is a bad title for any section of a gas undertaking's organization. A " service " department or even an " inquiry " department is much better and obviates any suggestion that gas appliances must be associated with complaints or that gas consumers as a class are so dissatisfied that a special department has to be created to deal with their grumbles. We suggest that an analysis of the work of a " complaints " department would show that the major activity is in dealing with innocuous and reasonable inquiries.

Another point—and we have mentioned this before—is that too great stress is laid on the word " maintenance." Here again we quarrel not with the principle, which naturally we entirely support, but with the word. In the Industry we all know what is meant by maintenance, that success is not to be achieved by undertakings which do not adopt the policy of showing consumers, domestic and industrial alike, how they can obtain the best results from the use of gas. But we think that the substitution of " service " for " maintenance " would be a psychological gain. It would prevent any consumer from running away with the idea that gas apparatus will not function without a great deal of skilled supervision. What we should emphasize is that the installation of gas appliances, far from creating anxiety, eliminates all worry.

A Notable Midlands Gathering

More space than we are ordinarily inclined to devote to social functions is given in our issue this week to an event which was styled by its promoters the Midland Gas Industry Dinner and Dance, held in Birmingham at the beginning of last week. We do not by any means imply that we normally grudge the space to reports of social gatherings because we do not approve of them; they frequently constitute, in fact, a very pleasurable background for the advancement of business relations. But the function in the Midlands to which we refer seems to us to have had a very special significance, as, indeed, we imagine its promoters intended it should have. Actually it was the successor to a series of similar gatherings organized in recent years by the Midland Association of Gas Engineers and Managers; on this occasion Mr. R. J. Rogers, representative of the side of the Industry which supplies plant and appliances, joined hands as organizing secretary with Mr. S. J. Sadler, Hon. Secretary of the Association, and representative therefore of the gas manufacture and supply side, and there emerged a highly successful Midland Gas Industry affair.

Even so we might perhaps not have attached so much significance to it but for the presence of the President of The Institution of Gas Engineers and the Chairman of Council of the Society of British Gas Industries, and, while we are strongly in favour of allowing the holders of even such exalted offices as these to dine and dance in peace, we are bound to pay heed to what they say when they make public speeches on such an occasion as this—and in such terms as they used.

We therefore invite the attention of all who have the Industry's interests at heart to our account of the event in later pages, and particularly do we urge this upon those among the plant and appliance makers who either have no use for an association, or who, being members, are little more than half-hearted about the Institution which already exists.

The New Spirit

We do not intend to infer knowledge of any definite plans in the Midlands for what Mr. Valon Bennett termed the " districting " of the British Gas Federation, but we do regard the Birmingham event as a further manifestation of the new spirit which called the Federation into being towards the end of last year. As we pointed out not long ago, this new spirit of co-operation gives to the plant and appliance makers the chance of a lifetime, and if they do not seize it with welcoming hands they will be doing an injustice not only to themselves, but to the Industry of which they form such an important part. " Important " is by no means too strong a term in which to describe their position, though perhaps with becoming modesty they remind us seldom enough of what the Industry owes them in its rise to its present position—in their research work past and present, in the very highly skilled technical staffs they maintain, through thick and thin, always at the service of everybody, and perhaps not least of all in the healthy rivalry among themselves which they have never abandoned, and which does so much to ensure a square deal for the individual gas undertaking.

The manufacturers have, indeed, stood for progress from the beginning of all things, and we believe, on the whole, when the gas engineer pauses to think he gives them full credit for it. Certain it is that their knowledge and experience, and their willing co-operation, have at one time or another been invaluable to almost every gas undertaking in the land, of whatever size.

Where is the Fault?

When, therefore, Mr. Douglas W. Turner, as Chairman of Council of the S.B.G.I., says at Birmingham that the work of the Society has not always been fully appreciated, and that there has been a tendency for it to occupy rather a secondary position in the Industry, we are inclined to hold the Society itself not altogether blameless in the matter. This means, of course, that we attach responsibility firstly to those who are its constituent members, among whom there have been some who openly confess to half-heartedness about their national body. We imagine they can be in no doubt—less than ever so at the present juncture—as to the advantages of having a strong organization of adequate prestige to represent their collective views, and in the interests of the Industry which we all serve we hope that constructive criticism in the proper quarter will take the place of lukewarm aloofness where such has existed. We do also sincerely commend to those who have hitherto stood outside the national body to give the question renewed consideration. They doubtless have their reasons of which we are not aware, but in our view the same argument holds—that an association representing as near one hundred per cent. as possible of their side of the Industry should be a fully recognized and integral part of the whole, and that it is up to them to make it so.

Towards this end, and towards the establishment and maintenance of the best possible relations between gas undertakings and " contractors," we welcome such gatherings as the one held in Birmingham last week. As we have already noticed, it was an easy step from a more restricted affair established as an annual event in pre-

vious years. But it should not be beyond the wit of other districts to discover an excuse for similar enterprise, and we commend the idea to their attention.

Gasholder Inspection

We are glad that during the meeting of the Midland Association of Gas Engineers and Managers, a full report of which appeared in our pages last week, the Secretary of The Institution of Gas Engineers emphasized the importance of gasholder inspection and maintenance, though he made it clear that he did not purport to convey the views of the Institution in any opinions he expressed. As each year passes this matter must become of greater moment to our Industry, for it is a false assumption that any material will last for ever or that the tensile strength of paint is equal to that of the structure painted. There are hundreds of holders which have been in commission for a very long period, and it is essential that every gas engineer should satisfy himself that all is well which on the surface may appear to be. Two recent accidents in different parts of the world give added weight to our contention. The Gas Industry has enjoyed for a century and a quarter a magnificent safety record, and at all costs this record must be maintained by those now responsible for the operation of gas-works plant. Lack of attention to this vital point will bring discredit on our Industry.

Now it is not to be expected that every gas engineer should be a gasholder expert. In point of fact few gas engineers would be so bold as to claim that they are gasholder experts. Therefore, in view of the large numbers of old holders in service, we suggest that, for their own protection, expert advice should be sought. Such expert advice can be supplied by the gasholder firms, and their reports should be studied very carefully, and the decision to let sleeping dogs lie should not be lightly taken. Maybe in some circumstances those in charge of small works hardly feel justified in making recommendations on their analyses of such reports, but in such cases independent advice would solve the problem.

Not for one moment are we being critical of the skill of the gas engineer, but it does appear to us that the splendid record of the Industry is sufficient cause for our expressing these views. We have spoken particularly of old holders, and everyone in charge of them should be fully satisfied that corrosion, through whatever cause, external or internal, has not weakened the structure to such an extent that an unusual and unforeseen strain might cause damage. Especially necessary, we suggest, is it to examine thoroughly the condition of crown plates, which have to withstand the major strains and stresses, and corrosion should be looked for at the joints as well as of the plates themselves. Time alone, however, is only one element in determining whether a holder does or does not require repair. Local circumstances, including weather conditions, geographical situation, actual quality of the metal at the time the holder was erected, and the maintenance which has been given to it throughout its life, play an important rôle and call for the examination and inspection of holders which may have been in service for a comparatively short period.

Internal examination is, of course, desirable, but to-day expert external inspection alone can accomplish a very great deal. We advocate internal examination where possible; external examination is always possible. We cannot see why any engineer should not welcome such expert inspection. It is a reasonable precaution to safeguard his own interests. Moreover, it is not a question of expert inspection every few minutes. A favourable report would set the gas engineer's mind at rest for years. An unfavourable report would suggest a remedy, and the remedy applied would have the same effect.

The Lighting Load

In our columns last week "Quidnunc" made some pertinent observations on the lighting load which deserve underlining. First of all he said that those who maintain that loss of this particular business would sound the death-knell of the Gas Industry are entirely mistaken. There is ample evidence to substantiate this. The lighting field is one section only of our business, and in other channels, heating and water heating in home and industry, sales are expanding rapidly. Electricity will never oust gas for these purposes. Yet that comforting fact is not an excuse for losing the lighting load without troubling about it, and there is no question whatever that gas men as a whole are not paying sufficient attention to the business. There are exceptions, of course, where gas managers believe in the load, and are finding that, by adopting modern sales methods and selling illumination rather than so many cubic feet or therms of gas, the position is not nearly so bad as is so often painted. We have recently been able to record several gratifying results of new buildings and large blocks of flats where gas lighting has been installed to the satisfaction of owner, architect, and tenant alike. This is modern gas lighting.

There are also gas managers who, while sincerely believing in the merits of gas lighting, are selling it with far too much diffidence. In their sales campaigns, instead of emphasizing the superior qualities of gas lighting when compared with electric lighting—that, for example, it is much better for the eyesight—they put first and foremost cheapness. Gas may be, and usually is, more economical than electric light, but it should be sold to the public on the grounds that it is a better service. It should be sold with all the points of convenience, reliability, and artistic effects in the foreground. Modern switch-controlled gas lighting is to-day known to the few; it should be made known to the many. By far the vast majority of the public are unaware that, from the artistic point of view, gas is at least the equal of electricity when applied through modern fittings. Gas standard lamps and table lamps are available in a variety and quality of design which would appeal to the new generation if only our young men and women were not left in ignorance of the developments recently made in the technique of gas lighting. It is a pleasure and at the same time distressing to hear the favourable comments of those to whom we have demonstrated modern gas lighting. It is distressing that we should have been the first to awaken their appreciation of the artistry of gas lighting to-day.

Our contention is plain enough. We should sell the lighting load not on its cheapness alone, but on all its merits. The former plan is tantamount to admitting that gas is an inferior source of illumination, which the facts disprove.

Jubilee Illuminations

The Gas Industry will add to the gaiety of the Nation in its rejoicings during the Jubilee Celebrations, arrangements for which are now well advanced. Special window and carnival displays and schemes for festive lighting have been thought out, and in these schemes floodlighting will play no small part, and, we feel sure, to excellent

effect. But something more than the accepted floodlighting is the aim of the Birmingham Gas Department, and in the "JOURNAL" to-day Mr. A. W. Smith, General Manager and Secretary, explains what it is intended to do. His point is that the public do not properly differentiate between gas floodlighting and electric floodlighting—which is obviously a compliment to the latter; and his aim is to carry out a spectacular effect unmistakably "gas" which simply cannot be obtained by electricity. Mr. Smith's illustrated account will be read with the liveliest interest, and we suggest that his scheme merits the flattery of imitation—even if such imitation is additional to other means of lighting display. By the way, it would be interesting if, in connection with the flares on the new Birmingham Fire Station, the Gas Department would arrange with the Electricity Department to install a cascade of electric lights to suggest a stream of water playing upon the flares. Such a display would admirably typify that the electricity industry is by no means extinguishing Gas; and we are all for truth in advertising.

Unwished-for Publicity

IN a later column this week we reproduce a short article entitled "Scramble to Buy up Small Gas Companies," from the financial feature of one of the national Sunday newspapers. Many members of the Gas Industry will doubtless have seen it in its original setting, and possibly dismissed it as very well-written and amusing fare for the general reader. They may even have welcomed it as according fairly generally with the views of the Industry upon amalgamation and grouping, but even so we cannot believe that publicity of this kind is anything but harmful to us. The damaging aspect of it is, of course, the hint it contains of a departure from the "clean" finance which has always been associated in the public mind with gas, greatly to the advantage of our Industry as a public utility, with all that the name implies in service to the consumer rather than quick riches to the supplier.

It may be asked by some whether these "travelling buyers" and "gamblers anxious to secure an intermediate profit" mentioned by the *Sunday Express* are merely picturesque figments of the writer's imagination. If they are not, then many of our readers will have met them in the flesh, but in any case we ourselves, though not owners even of a "tiny" gas-works, have come across something that very nearly fits the description. It is part of our daily routine to act as a general information bureau, and to answer an endless variety of questions on many topics connected with the Gas Industry over the past eighty-five years. A stockbroker inquired the other day what we could tell him of the working of a certain sixty million country undertaking, and when we asked him the reason for his interest he did not hesitate to say that there was very easy money to be had for "introductions" of suitable gas companies to hungry groups.

To quote the *Sunday Express* article again—"indiscriminate buying-up of gas companies in scattered areas is not going to aid the Industry to any marked extent, and leaders in the Industry regard the movement with some apprehension." So do we all, but none of us can see what is to be done about it, except to hope that the gas-minded groupers will beat the non-gas-minded fraternity all along the line. In the meantime, though we think that articles like the one we have quoted are salutary for dissemination within the Gas Industry, we regret that there should be any justification for their publication in the national Press.

Photography by Gas Light

COMMENTS made recently to us by a prominent South London photographer provide an interesting viewpoint on the merits of gas light and why it is so greatly preferable for the photographer's art. This particular photographer had not long before taken a number of excellent impressions of the interior of a church under gas lighting, which, he considered, would have provided nothing like the minuteness of detail nor the pleasing light and shadow effects under electrical illumination—even at double the length of exposure. In fact, he had, he observed, never obtained better interior results than these by gas lighting, though he had spent the greater part of a lifetime in the profession.

We asked the photographer what were the reasons, in his opinion, for such greatly enhanced results under gas lighting conditions. His chief reason was the greater penetrating power of gas light and the quality of its rays giving finer detail of grain in the dark oak woodwork in this particular case. The original print showed this very clearly. He had seen examples of elaborate systems of electric lighting, he added, with high-powered units, the illumination of which, however, was trying to the eyes, and was detrimental from the photographer's standpoint, as, indeed, it is from that of good lighting. As regards the actual installation in question, there are now revealed beautiful corners which have not been properly visible before. Parts of this old church, in which a score and more of generations have worshipped, had never been seen until directive gas lighting brought out the beauty of detail which no other form of illumination could have achieved. The photographs in question were reproduced in our columns.

Personal

Mr. F. G. MANTLE has been appointed Manager and Secretary of the Lichfield Gas Company. For eleven years Mr. Mantle was Assistant to Mr. F. Key prior to his retirement last September, and has been Acting Manager and Secretary since that date.

* * *

Mr. R. C. OLIVER has been appointed Chairman of Morpeth Gas Company in succession to the late Major Ralph Crawford.

* * *

Mr. LOUIS W. HARRISON, M.Inst.Gas E., has been appointed Assistant Engineer and Manager of the Barnsley Gas Company. Mr. Harrison was one of four who obtained a First-Class Diploma in Gas Engineering in 1929.

* * *

Before a company of 250 employees of the Cambridge University and Town Gas Light Company, Mr. A. D. RAYNER, Accountant and Secretary of the Company's co-partnership scheme, was last week presented with a gold hunter watch on his retirement after 28 years' service with the Company. The presentation was made by Mr. H. Shewring, Engineer and Manager of the Company, who was supported by Messrs. H. R. Thomas (Assistant Engineer and Manager), W. G. Bradford (Chief Clerk), and H. Sword (District Superintendent).

Obituary

The death occurred on March 8 of Major RALPH CRAWFORD, of Stanton Fence, after a short illness. For over 34 years he was Chairman of the Board of Directors of the Morpeth Gas Company, and had been a member of the Board since 1899. He was aged 74. In 1933, the Honorary Freedom of the Borough of Morpeth was presented to Major Crawford in recognition of his distinguished services.

* * *

The death has taken place at the age of 94 of Mr. DANIEL BLYTH, who for many years was a Director of Pittenweem Gas Company.

News in Brief

The Austrian Association of Gas and Water Engineers are holding their Annual Conference in Gratz on May 31 and June 1.

An Exhibition at Stowmarket was recently held by Stoves, Ltd., in conjunction with Radiation, Ltd. It was well attended and featured many interesting lighting, heating, and cooking appliances.

T.I.C. Plant at Stockholm.—In our article describing this plant in the "JOURNAL" for March 6, p. 578, we gave the dimensions of the still as 7 in. in diameter and 14 in. in overall depth. The diameter of the still is, of course, 7 ft.

Cookery Demonstrations are being given twice daily at Beasley's Hall, Rickmansworth (Herts.), by Miss E. D. Crossland for the Watford and St. Albans Gas Company, this week. Miss Crossland is also organizing a children's cake baking competition.

The Approaching Completion of a Gas-Works in Tripoli, North Africa, has led the Tripoli Chamber of Commerce to arrange a display of gas apparatus at the Ninth International Fair which has just been opened in that town and which will continue until May 17.

Practical Cookery Demonstrations are being given this week by Mrs. M. A. Anthony, of the Radiation Research Kitchen, at an exhibition of gas appliances at St. Margaret's Hall, Uxbridge, under the auspices of the Uxbridge, Maidenhead, Wycombe, and District Gas Company.

Every House on the Garston Estate, Watford, is piped for five gas fires. On a neighbouring new estate of 78 dwellings—the Bradshaw Estate—three points are provided for gas fires and the standard equipment includes a gas cooker, a gas wash copper, and a gas water heater in each house.

The Popularity of Cookery Lectures was proved by the good attendances at the Dewsbury Town Hall on the afternoon and evening of March 11 and 12, when the Dewsbury Corporation Gas Department organized a demonstration of gas appliances. Over 2,000 people attended.

An Increase of 4·42% is reported by Mr. H. G. Ritchie, Engineer and Manager of the Falkirk Gas Department, in the output of gas during the month of February, which amouted to 37,293,000 c.ft., or 160,359 therms, as compared with 35,712,000 c.ft., or 153,561 therms, for the corresponding month of last year.

Gas in Housing and Slum Clearance is the subject of the current issue of *A Thousand and One Uses for Gas* (No. 252, Vol. XXIII., published by the B.C.G.A.). It throws a useful light on what the Gas Industry can do and is doing in this important direction, and exemplifies appropriate gas installations for all types and sizes of modern dwelling.

A Surplus of £9,035, as compared with the estimated one of £5,409, is expected to be shown on the working of the Gas Department by the Wallasey Town Council. The total working expenses of the Undertaking amount to £154,376, which is £4,656 more than the estimate. Up to the present time the total income of the Undertaking amounts to £192,045, which is £6,161 more than the estimate.

A Successful Demonstration Week which attracted large attendances at both afternoon and evening lectures was recently held by the Annan Gas Company in their showrooms. Menus were prepared by Miss G. L. Hughes, of the Parkinson Stove Company, Ltd., and the various dishes were cooked in a Parkinson "Newpark" cooker. The lectures were witnessed by nearly 1,000 local housewives. A cake baking competition also proved very popular, prizes for which were presented to the successful competitors by the Chairman of the Company, Capt. W. Cuthbertson.

Gas is Very Much in Evidence in the Demonstration House on the Manor Estate, Lillington, thanks to the well-directed efforts of the Leamington Priors Gas Company. The bedrooms are equipped with gas fires while the lounge has an open grate and gas poker for lighting. A Radiation "New World" cooker is installed in the kitchen as well as a 10-gallon wash boiler, a chromium-plated K.C.U. water heater, and gas iron. A Richmond "Don" geyser, finished in chromium and white enamel, is fitted in the bathroom, and the hall and garage are heated by a Flavel panel heater and a garage safety heater respectively.

Natural Gas for Bucharest?—A meeting of representatives of seven of the principal petroleum concerns in Roumania was recently held in Bucharest when the proposal to draw gas from the wells and supply it to the Roumanian capital was further discussed. The cost of the necessary pipe lines, compressors, &c., is estimated at 220 million lei; it is hoped to commence work on the installation before the end of the present year.

Reconstruction of a Continental Steelworks Coking Plant.—The Ver. Hüttenwerke Burbach-Eich-Düdelingen A.G., in Saarbrücken, has placed an order with the firm of Koppers to replace an existing battery of 60 Coppée ovens by 60 Koppers Regenerative Circulation ovens. The new ovens are to be 18¾ in. in width and will operate upon compressed coal. With the anticipated carbonizing time of 20 hours, the throughput of the plant will be 666 tons of coal per day on the dry basis.

Owing to the Celebration of the Silver Jubilee of the Accession of Their Majesties the King and Queen, it has been decided to cancel the meetings of the Liquor Effluents and Ammonia Committee and the Joint Research Committee of the Institution of Gas Engineers provisionally fixed for the morning and afternoon respectively of Friday, May 3, and to convene them a week earlier—viz., Friday, April 26: 11 a.m., Liquor Effluents and Ammonia Committee; 2.30 p.m., Joint Research Committee.

A Well-Attended Exhibition was recently held at Fordingbridge by the Fordingbridge Gas Company, Ltd. The displays were very comprehensive and included lighting, heating, and cooking apparatus. "Bakerloo," "Newhome," and "Kitchenette" cookers were shown, while the "Silo" Matchless Fire was a prominent feature. Much interest was evoked by the new "Veritas" instantaneous sink water heater of Messrs. Falk, Stadelmann, & Co., Ltd., who also supplied modern chromium art pendants and other appliances.

Over 1,200 People attended the exhibition held last week by the Whitby Gas Company at the Church House. The sales of appliances constituted a record. At the opening ceremony, Mr. William M. Galleway, Secretary and Manager, reported that additional concessions were to be made to consumers in the form of discounts. A series of cookery lectures were given daily by Miss Sanderson, First-class Diplomée, N.T.S.C., and Gold Medallist, U.C.F.A. The number of competitors in the cake baking competitions exceeded those of the previous year.

The Cowbridge Gas Company (1935), Ltd., was registered on March 21, having among its objects the acquisition of the Undertaking or parts thereof of the Cowbridge Gas Company, and to carry on the business of a Gas-Works Company in all its branches. The new Company has a capital of £1,000 in £1 shares, and among the Directors are Mr. W. Clark Jackson, Engineer and Manager of the Neath Gas Department; Mr. J. H. Canning, Engineer and Manager of the Newport (Mon.) Gas Company; and Mr. Arthur D. Howells, Assistant Engineer of the Neath Gas Department.

Correspondence

The Lighting Load

SIR,—"Quidnunc's" challenging article in last week's issue was badly needed. It seems to me that many gas men, so alert in other matters, have a sort of inferiority complex with regard to domestic lighting that dates back to the old-fashioned gas jet. There is no doubt that the electricity people sedulously foster the idea that gas is out of fashion.

When motor transport became practicable some years ago the coach proprietors did not say: "All the population is railway-minded now; with the conveniences and facilities furnished in railway trains, and their punctuality and quickness, it is hopeless for us to try and compete for the traffic. That was lost with our grandfathers." Instead they realized the new opportunities. In the same way the Gas Industry should appreciate that developments in gas lighting technique afford similar opportunities.

Yours, &c.,
"ONLOOKER."

March 23, 1935.

Members of The Institution of Gas Engineers have been invited to participate in the meetings and social functions of the symposium on the welding of iron and steel to be held under the auspices of the Iron and Steel Institute on May 2 and 3, 1935. Programmes, forms of application for tickets, and publications can be obtained either from the Secretary of the Iron and Steel Institute, Mr. K. Headlam-Morley, 28, Victoria Street, S.W. 1, or from Mr. J. R. W. Alexander, Secretary of The Institution of Gas Engineers.

A National Cookery Competition for Schoolgirls, to be organized by the Gas Industry, is now under consideration, states the current number of *Home Service*. The scheme would involve close co-operation with local education authorities, so as to embrace every girls' elementary school in an area of gas supply. It is suggested that the winners in each district should be sent to London to compete for the Girls' Cookery Championship. If the scheme is put into operation, it will undoubtedly raise the keenest interest throughout the country and result in much beneficial publicity for the Industry.

The Enniscorthy Branch of the Irish Transport and General Workers' Union has called on the local Urban Council to have gas installed in their new houses instead of electricity. The Enniscorthy Gas Company, states the Union Secretary in his letter, employed all trade union labour and paid almost £2,000 per year in wages. Over a dozen local families were dependent on the Gas Industry for a livelihood. The Gas Company, it was further added, paid £174 annually in rates, while other interests represented by the Company in the town paid fully £4,000 annually in wages. Up to the present the matter of lighting municipal houses has been left to the tenants, and it is strong proof of the value of the gas that the Gas Company has succeeded in securing to date 95% of the installations in open competition.

Bright Gas Display at Exmouth

Our photograph shows the stand of Stoves, Ltd., at a recent Exhibition at Exmouth, which was arranged in conjunction with Messrs. John Wright & Co., Ltd. More than 5,000 people visited this Exhibition, which was a marked success.

Gas Appeals

We understand that the Board of Trade has recently appointed Mr. Herbert Royston Askew (Barrister-at-Law), of Palace Chambers, Westminster, London, S.W. 1, to determine two appeals which have been made to the Board under Section 6 (2) of the Gas Regulation Act, 1920, as amended by the Gas Undertakings Act, 1934.

Section 6 (2), as amended, provides as follows:

"If the undertakers think themselves aggrieved by any report of a Gas Examiner they may, within seven days, appeal to the Board of Trade, who shall appoint a competent and impartial person to determine the appeal, and that person may confirm, with or without amendment, or annul, the report; and his decision, after considering any representations made by the parties in writing, or, if requested by any of them to do so, after hearing the parties, shall be final and conclusive."

(Section 6 (2) of the 1920 Act, before amendment by the 1934 Act, provided for appeals to be heard by the Chief Gas Examiner.)

On Dec. 31, 1934, the Board of Trade revoked the Gas Regulation Act Appeal Procedure Rules, 1922, and substituted the Gas Appeal Procedure Rules, 1934.

The Mossley and Saddleworth Gas Order

Objections Withdrawn.

The inquiry which Mr. J. F. Ronca, O.B.E. (Director of Gas Administration), had arranged to be held on Friday, March 22, at the Board of Trade Offices, Westminster, into the Special Order promoted by the Mossley and Saddleworth Gas Company, Ltd., under the Gas Undertakings Acts of 1920 and 1934, was cancelled, inasmuch as the objections were withdrawn.

The Order, as promoted, confirms an agreement by which the Mossley and Saddleworth Gas Company, Ltd., is to purchase the gas undertaking of the Borough of Mossley, in the County of Lancaster.

The Order also repeals the Mossley Gas Acts and Orders, and defines the limits of supply of the Company as the Borough of Mossley, the Urban District of Saddleworth, and part of the Urban District of Springhead (the latter in the West Riding of Yorkshire). The share capital of the Company, for the purposes of the Undertaking, is not to exceed £250,000, and there is provision for the raising of loan capital to the extent of 60% of the paid-up share capital. The Company is to operate on the basic price and dividend system, the basic dividend on the ordinary capital being 5%, and the maximum dividend on preference capital is to be 6%. The basic price is fixed at 11·14d. per therm; and there is provision to enable the Company to charge a differential of two-fifths of a penny per therm in the area of supply outside the Borough of Mossley. There is provision for the future revision of basic price by the Board of Trade on the application of the Company or a local authority.

The Company is empowered to set up reserve, special purposes, and renewal funds.

Objections were raised by the Saddleworth and Springhead Urban District Councils, the Oldham Corporation, and one private individual, but were subsequently withdrawn. Presumably amendments will be made to the Order to meet the points raised by the objectors.

Forthcoming Engagements

March.

28.—SOUTHERN ASSOCIATION.—Annual General Meeting, Hotel Metropole, London. Presidential Address of Mr. E. L. Nicholas, of Guildford.
29.—I.G.E.—Joint Lighting Committee, 2.30 p.m.

April.

2.—I.G.E.—Research Executive Committee, 2.30 p.m.
4.—B.C.G.A.—Eastern District Meeting, Peterborough.
4.—MIDLAND JUNIOR ASSOCIATION.—Meeting and Paper by Mr. Leonard Bott.
5.—NORTH BRITISH ASSOCIATION.—Spring Meeting at Dunfermline.
5.—B.C.G.A.—Annual Meeting of Gas Salesmen's Circles, Caxton Hall, S.W. 1.
6.—MANCHESTER AND DISTRICT JUNIOR ASSOCIATION.—Annual Meeting at Manchester. Paper by Mr. H. Partington and Dinner at 5.30 p.m.
8.—I.G.E.—Finance Sub-Committee, 1.45 p.m.
8.—I.G.E.—Membership Sub-Committee, 2.30 p.m.
8.—I.G.E.—General Purposes Committee, 3.15 p.m.
8.—I.G.E.—Benevolent Fund Committee of Management, 4.30 p.m.
9.—I.G.E.—Council Meeting, 10 a.m.
9.—I.G.E.—Education Committee, 4 p.m.
10.—I.G.E.—Education Executive Committee, 10 a.m.
11.—S.B.G.I.—Council Meeting, 2.30 p.m.
13.—SCOTTISH JUNIOR ASSOCIATION (EASTERN DISTRICT).—Visit to Kirkcaldy. Paper by Mr. J. M. Dow.
13.—YORKSHIRE JUNIOR ASSOCIATION.—Meeting at Bradford. Paper by Dr. H. A. Fells.
26.—I.G.E.—Liquor Effluents and Ammonia Committee, 11 a.m.; Joint Research Committee, 2.30 p.m.
27.—I.G.E.—Examinations in Gas Engineering.

May.

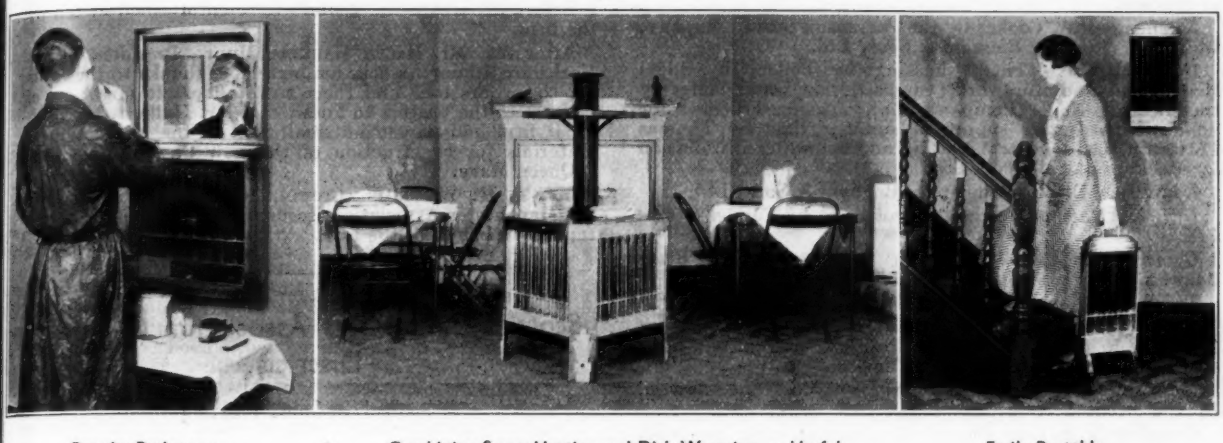
3.—WALES AND MON. JUNIOR GAS ASSOCIATION.—Annual General Meeting at Cardiff, 6.45 p.m.
4.—I.G.E.—Examinations in Gas Supply.
15-16.—EASTERN COUNTIES GAS MANAGERS' ASSOCIATION.—Spring Meeting at Stamford.
16.—MIDLAND ASSOCIATION.—Spring Meeting at Hereford.

June.

4-7.—I.G.E.—Annual General Meeting in London.

An Attractive New Heater

A Wide Range of Applications



For the Bathroom.

Combining Space Heating and Dish Warming—a Useful Application in the Restaurant.

Easily Portable

A pleasing and useful new gas heater is the " Il-Co-Rad," which, illustrated in a few of its many applications in our photographs above, has recently been placed on the market by Messrs. Sidney Flavel & Co., Ltd., of Leamington.

A development of the " Radiant-Panel " gas heater but lighter in character, this new model opens up a new line of approach in the direction of combining heating units in utility furniture, such as a serving table in a restaurant or a display counter in a shop. The makers, we understand, propose to approach shop-fitters, &c., with idea of " incorporating the heating in the initial design "—a very sound sales method, which should prove of value to the Gas Industry in this connection.

The " Il-Co-Rad " embodies tubes in units of 4, 8, and 12, the lower of which are of glass, coloured ruby, amber, crystal, or clear. Each tube encloses a pencil flame from the burner, and the effect, in conjunction with a polished reflector at the rear, is a pleasing illumination. The 4 and 8 tube units are produced in portable, wall, and built-in form. The portable model is provided with a handle for carrying from room to room. A novel application of the heater is in the form of an 8-tube unit with a full width mirror above. This will be found particularly suitable as a shaving mirror in a bathroom. It is constructed to convey the heat from the products up a flue at the back of the mirror, and consequently the mirror cannot steam over.

Another application of the heater is for use in restaurants and cafés. In this case, the heater is constructed as a battery of 4 units each of 8 tubes, and the products are conveyed under the metal top on their way to the flue, providing a useful hotplate in addition. The design of the heater in this battery formation will recommend itself as suitable for consideration as a unit for the complete decoration scheme, by reason of the variety of finishes which are available.

The light weight of the heater may be gauged from the fact that the medium size weighs only 16 lbs. The heater is fitted with a governor, and the consumption is stated by the makers to be 1 c.ft. of gas per tube per hour. Connections are concealed in the hinged base and are readily accessible.

Scramble to Buy Up Small Gas Companies

Headline and all, we reproduce this article from this week's *Sunday Express:*

Happy days are here again—for the proprietors of small gas-works.

These obscure individuals never realized until recently how popular they were, how important their function in the fabric of British industry.

Enlightenment has come through the formation of gas "holding companies." Holders of shares in tiny local gas-works are receiving visits from men who are anxious either to buy their gas-works outright or secure an option over them.

Manager and Stoker.

Some of them represent important financial interests. Others are less worthy; they are nothing more than gamblers anxious to secure an intermediate profit in the buying and selling of the property. Their method is to get an option and then speed away to the City to try to secure the finance needed to exercise it.

Some of these travelling buyers are having interesting experiences. One called at a gas-works in an obscure corner of the Kingdom of Fife and asked to see the manager.

A hefty, black-faced Scot turned up after some delay. "I'm manager and stoker," he said. It was subsequently revealed that the staff of this concern consisted of thirteen directors, two stokers, and a boy.

Too Many Companies.

On broad principle, amalgamation in the Gas Industry should be a good thing. There are 1,326 separate gas undertakings in the kingdom. 90% of the total gas output is produced by 846 undertakings.

That means that nearly 500 companies, or 36% of the total, produce less than 10% of the output.

Some of these tiny concerns do not produce economically. Often they allow the " liquor "—as gas men call the stuff which contains the valuable residuals of coal carbonization—to run to waste, polluting the local streams. Their charges range up to 7s. per 1,000 c.ft.

What is Wanted.

It would be a good thing if some of these could be brought under unified control and operated more scientifically. But this would involve physical amalgamation—a policy which the existing holding companies are not attempting.

There is practically no limit to the area over which gas can be supplied through the mains.

What is wanted is the closing of the tiny gas-works and the substitution of supply from a larger plant in a neighbouring district.

Indiscriminate buying-up of gas companies in scattered areas is not going to aid the Industry to any marked extent, and leaders in the Industry regard the movement with some apprehension.

A Pioneer.

Promoters of some of the holding companies do not appear " gas-minded " to the same degree as, for example, the interests behind the South-Eastern Gas Corporation.

This Company, controlled by the Gas Light and Coke Company, is easily the best example of the holding company movement. It has already been responsible for several price reductions. If—as seems likely—the different companies are linked up and production is concentrated in larger works, further concessions may be made to consumers,

Gas in the King's House

"The King's House"—the Royal Warrant Holders' Association Jubilee gift—is to be fitted with gas and coke equipment for cooking, water heating, room warming, and central heating. The actual apparatus to be installed is as follows:

Kitchen.—R.A. Cooker by the Parkinson Stove Company, Ltd.; hot closet by Benham & Sons, Ltd.

Boiler House.—Central heating by boilers by Ideal Boilers and Radiators, Ltd.; domestic hot water boiler by the Beeston Boiler Company, Ltd.; gas-fired boilers for domestic hot water supply in summer time by Thomas Potterton, Ltd.; central heating and hot water installation by Mackenzie & Moncur, Ltd.

Laundry.—Drying cabinet by Benham & Sons, Ltd.

Drawing Room.—Gas-ignited coke fire by Carron & Co., Ltd.

Owner's Bedroom.—Gas fire with surround, Bratt Colbran & Co.

Third Bedroom.—Gas fire with surround, Bratt Colbran & Co.

Maid's Bedroom.—"Varsity" fire by Radiation, Ltd.; surround by the Leeds Fireclay Company, Ltd.

Maid's Sitting Room.—Gas fire, Bratt Colbran; surround by the Leeds Fireclay Company, Ltd.

Chauffeur's Sitting Room.—Gas-ignited coke fire with mantel suite by S. Flavel & Co., Ltd.

Chauffeur's Kitchen.—"Champion" (K.91M) cooker by Cannon Iron Foundries, Ltd.

Chauffeur's Bedroom.—"Panno" gas fire and surround by the Parkinson Stove Company, Ltd.

Manchester and Yorkshire Junior Associations

A Day at Sheffield

The customary annual joint gathering of the Manchester and Yorkshire Junior Gas Associations took place on March 20, when the members gathered in large numbers at Sheffield.

By courtesy of the Directors of Sheffield Gas Company, of Messrs. Firth-Vickers Stainless Steels, Ltd., and of Messrs. Thos. Firth & John Brown, Ltd., the morning trains from various parts of Lancashire and Yorkshire were met at the two main Sheffield stations by motor buses, and the visitors conveyed to the Staybrite Works of Firth-Vickers Stainless Steels, Ltd., Weeden Street. Here more than an hour and a half was spent in a highly interesting tour of the works, after which the visitors were conveyed to the Royal Victoria Station Hotel for lunch, as guests of the Sheffild Gas Company.

Mr. J. Carr, M.C. (President of the Manchester District Association), proposed hearty thanks to the Sheffield Gas Company and Firth-Vickers Stainless Steels, Ltd. Mr. Carr felt the possibilities of industrial usage of gas had not yet been fully appreciated by the industrial public and perhaps not entirely so by many in the Gas Industry itself. They had that morning had a very instructive example of such usage by a works which consumed some 450 million c.ft. of gas per annum for industrial purposes, and the visit suggested what a wide field of large consumers there must be in other industrial directions.

Mr. J. W. Carlton (Shipley), Senior Vice-President of the Yorkshire Association, seconded the vote and remarked that when one saw the extent to which gas was used in Sheffield one began to realize what a lot there was still to be learned as to its future possibilities.

Mr. Ralph Halkett (General Manager and Secretary of the Sheffield Gas Company), responding, said it was always a pleasure to welcome the members of the Junior Associations to Sheffield. On that occasion they had the added pleasure of welcoming other visitors, including Mr. Shaw (President of the Manchester Association of Gas Engineers); Prof. D. Hay (of the Midland Association of Mining Engineers); Mr. A. L. Holton (Chief Engineer of the Manchester Gas Department); and Mr. Crease and Mr. Armstrong, of Messrs. Firth & Brown. It was six years, said Mr. Halkett, since the Junior Associations last met jointly at Sheffield. At that time the Gas Company took only 2,500 million c.ft. of coke oven gas. To-day they were taking 6,000 millions from eight coking plants, and were preparing to take still more. In regard to industrial use of gas, Mr. Halkett was of opinion that as yet they were only on the threshold of its possibilities. The Sheffield Company had made a very special study of gas for trade and industrial purposes and were always prepared to assist manufacturers with any problem in which gas was concerned.

Mr. Armstrong, responding on behalf of the steel firms, apologized for the absence of Mr. A. J. Grant, the Managing Director.

The afternoon visit was to the Atlas and Norfolk Works of Thos. Firth & John Brown, Ltd., steel manufacturers, and was again of great interest. In each visit industrial uses of gas were much in evidence.

Before departure the visitors were entertained at tea by the firm.

After tea, Mr. Ralph Halkett, Junr., President of the Yorkshire Junior Association, extended thanks to the hosts for the works tour and their hospitality. It might be of interest to the visitors to know, said Mr. Halkett, that this great firm had played no small part in the production of materials for construction of the new Cunard liner, the "Queen Mary."

Mr. T. H. Williams (Crewe), Senior Vice-President of the Manchester Association, seconded; and Mr. Armstrong replied on behalf of the firm.

Scottish Junior Gas Association (Western District).

Annual Business Meeting

The Annual Business Meeting of the Scottish Junior Gas Association (Western District) was held in "The Georgie" Restaurnant, Union Street, Glasgow, on March 23, 1935.

Mr. John Greig, Glasgow, the President, was in the chair, and after the minutes of the previous meeting had been read and approved, the Hon. Secretary and Treasurer presented his reports for the thirty-first Session.

The following officers and members of the Council were then elected for the Session 1935-36:

President.—Alex. Bujnowski (Glasgow).

Vice-President.—John Webster (Port Glasgow).

Hon. Secretary and Treasurer.—Joseph K. Campbell (Glasgow).

Members of Council.—N. Sturrock (Greenock), W. Campbell (Helensburgh), E. G. Smith (Dumbarton), W. Gledhill (Stirling), and D. Lambie (Coatbridge).

Auditors.—C. Gill (Glasgow) and W. E. Russell (Glasgow).

After the formal business had been conducted, a Paper was read by Mr. J. L. Crossley, of Glasgow, entitled "Workshops Practice," which will be found on another page of this issue of the "Journal."

The members later held their Annual Social, at which a very enjoyable evening was spent with high tea, whist, and dancing.

The Wales and Monmouthshire Association of Gas Engineers and Managers

Visit to the Cardiff Industries Exhibition

On March 21, members of the Wales and Monmouthshire Association of Gas Engineers and Managers visited the second Industries Exhibition held under the auspices of the Industrial Development Council of South Wales and Monmouthshire, which is being held at the Greyfriars Hall, Cardiff, until March 30.

The Gas Industry in that area have arranged a joint gas exhibit, and March 21 was appointed by the exhibition authorities to be a special Gas Industry Day. The members of the Association and others connected with the Industry were officially received by the Chairman of the Development Council, Councillor George Williams. The President, Mr. H. Barker, Llanelly, in the course of his reply to the address of welcome, referred to the support the Gas Industry was giving to the Development Council, as they were all dependent on the prosperity of that area. Cheap heat was far more important to manufacturers than cheap power, and at Cardiff they had an industrial research department where they were able to place problems submitted by industrialists before experts.

Mr. H. D. Madden, Engineer and Manager of the Cardiff Gas Light and Coke Company, also stressed the importance of the Gas Industry to the recovery of prosperity. Mr. W. Clark Jackson, Engineer and Manager of the Neath Gas Department, also spoke, as Vice-President, on behalf of the Neath Chamber of Commerce who were represented at the exhibition.

STANDARDIZATION OF Colour in the Gas Industry

by "SPECTRUM"

Our contributor suggests that the adoption by the Gas Industry of standard ranges of colours for all applications, as specified in the British Colour Council's Dictionary of Colour Standards, would have many advantages.

Reference was made in the "JOURNAL" only a few weeks ago to the move in the Gas Industry towards a greater measure of standardization, which, it was suggested, with full co-operation between seller, buyer, and user, would ultimately benefit all concerned. There is one phase of standardization, however, not then envisaged to which attention has been drawn by Mr. J. R. W. Alexander, Secretary of The Institution of Gas Engineers, and which is going to prove of increasing importance in the Industry in the future—namely, standardization of colours. For, following the present trend in the direction of a greater use of colour, not only for domestic appliances in the home, but also on the works and in the showrooms, the Gas Industry is entering—or will have to enter—this field still more fully as time goes on.

Much confusion has existed in the past in the world of colour, and until recently very little effort has been made to produce any form of standardized colour nomenclature. All coloured objects, materials, or surfaces produced since the beginning of time come within the family group of one of several spectrum colours—red, orange, yellow, green, blue, and violet. These six colours are unalterably fixed in the rainbow, and are similar to the pigmental colours used by man throughout the ages. We have organized practically all other human activities. We have organized the measurement of time, of weight, of distance. We have an alphabet, a fixed language, so that we can read and write and communicate with others. Yet one of the oldest of human possessions, the one thing common to the people of every nation—colour—which has been and will be unchangeable so long as the sun and the construction of the human eye remain as they are, is still a thing uncharted and practically unknown. Surely a strange admission in a so-called civilized age. No wonder the majority of people are afraid of colour—for their fear, like most fears, is the outcome of ignorance. We are entering the greatest colour-using age the world has seen—an age, too, of fierce competition—and in view of these facts, the subject of colour—its history, theory, and practice, as well as an understanding of the psychology of colour—is as important an educational subject in our present-day existence as the study of mathematics, literature, or history.

Barriers to Progress.

As was pointed out by Mr. Robert F. Wilson, General Manager of the British Colour Council, in a recent address to the Royal Society of Arts, one of the great barriers to progress in both the teaching and practical use of colour—commercially and æsthetically—has been the confusion of terms. With a view, therefore, to rendering the terms used in connection with the production and utilization of colours clearly defined, the British Colour Council has published a Dictionary of Colour Standards composed of two volumes. The first volume contains examples on silk ribbon of 220 colours on matt and glossy surfaces, each colour being named, numbered, and coded. The second volume gives a history of each colour, the various names by which each has been previously known, and the authority for standardization.

A complete range of spectrum colours was prepared, working through the hues from red to orange, orange to yellow, and so back through green, blue, and purple to red, thus forming a definite foundation which may be used as the basis of all colour education.

The maintenance of colour standards is a difficulty because there is always the likelihood of fading—whatever material is used. The colours shown in the British Colour Council's Dictionary of Colour Standards, however, were measured both with the colorimeter and by the tintometer, and in this way it is possible to check up as to whether or not the colours have faded. Readings on the colorimeter and tintometer of the 220 colours shown in the Dictionary are given in Volume II.

The colours, other than those decided on as spectrum colours, fall into three classes—those which can be matched to definitely existing standards, such as Wedgwood blue or Post Office red; those which can be matched to the average of a number of samples, whether animal, vegetable, or mineral, such as squirrel, carrot, and sapphire; and those of which the colour sensation attributed to a definite colour name shows a very wide divergence of opinion, such as sky blue, saxe blue, and old rose. The variety of specimens received for each colour was astounding; there were, for instance, 80 different sky blues, 60 different whites, and 40 different blacks.

The Council state that a great deal of misunderstanding on certain points can now be cleared up. There is no separate and distinct set of colours for each industry, and it is possible to match any product from silk ribbon. The 220 colours contained in the Dictionary have been adopted by the British Standards Institution as British Standard Specification No. 543-1934 and, through the Director of that Institute, have been put forward for acceptance to the standardizing bodies in the British Colonies and Dominions.

A Colour Language.

A number of important points are associated with the Dictionary. The range was drawn up on a system which makes it practicable as a definite colour language for all stages of colour education and in all colour-using industries. The range is so created that it can, if necessary, be enlarged to a regular graduated range. The colours have been measured scientifically so that the original standard can be permanently preserved.

It has been found that different colour-using industries have been so accustomed to matching to the materials in which they usually work, that they have been apt to lose sight of the fact that a similar colour can be reproduced in many materials and can be known by the same name. It is aimed to set up consultative committees to represent each specialized industry to work in conjunction with the British Colour Council, the object of these committees being to formulate a closer co-operation between those industries which react upon one another. For instance, a consultative committee concerned with interior decoration would ensure that manufacturers of household furnishing and equipment were planning ahead on similar lines. In this way dyers, manufacturers, wholesalers, and retailers are able to plan with a view to what a public of growing discrimination will wish to buy in six months' time, with a resulting economy of time and money and the reduction of unsalable stock.

Advantage to the Gas Industry.

It may now well be asked, "What advantage will this have to the Gas Industry?" From the point of view of commerce we do not necessarily produce to meet a demand; frequently the demand, both in home and foreign markets, has to be created, and the importance of colour is noticeable in all the human activities of an age of speed. The man who says it can't be done is interrupted by someone who is doing it. The advantages of this standardization of colour nomenclature to the Gas Industry will become more apparent as the matter is fully considered.

On the domestic side it has been the proud boast of the Gas Industry that we have been able to produce a coloured finish in, say, a gas fire which will harmonize with *any* scheme of interior decoration the housewife may fancy. But one gas undertaking's "sky blue" finish may be very different from another's. No industry, obviously, could adopt the whole of the 220 colours in the range; but what the Gas Industry could do is to adopt a range of two or three of the best standard tints in each main colour band, and offer them, with their correct British Colour Council nomenclature, to the public. In spite of differences in finish, surface, and texture, we could then establish a series

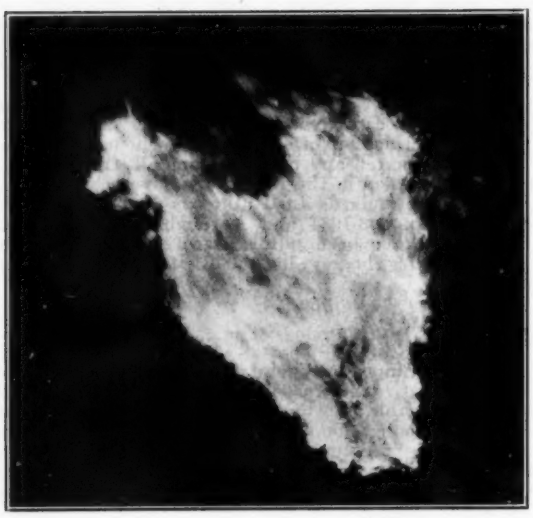
of standards that would be readily understandable, while many of the insipid tints of to-day would be replaced by really good colours.

Furthermore, the adoption of standard ranges of colours for gas-works plant would be of considerable assistance in ordering paints, and would, for example, enable Engineers to adopt a standard grey or green for gasholders that would be easily recognized by the paint manufacturers.

It may be of interest to note that the Institution of Gas Engineers have for some time past adopted the use of standard colours, not only in the decoration and furnishings of their offices, but also in regard to their publications. Similarly, certain of the British Colour Council's colours have recently been scheduled by the Gas Light and Coke Company. Again, there is vast scope for the standardization of colours in connection with showroom displays, posters, and so forth. If, for example, a gas showroom is decorated in certain standard colours, it would be a simple matter for the undertaking when applying, perhaps, for B.C.G.A. display posters, to specify certain definite colours which they could be certain would harmonize effectively with their scheme. There are, indeed, many more applications in the Gas Industry of a system of standard colour nomenclatures which will be readily appreciated upon further consideration.

The publication of this Dictionary of Colour Standards provides a good opportunity for the Gas Industry as a whole to take some definite steps towards the standardization of the colours it uses in all its branches—and so perhaps be the first complete industry in the country to do so.

Particulars of the Dictionary of Colour Standards may be obtained from the Secretary of the British Colour Council, 28, Sackville Street, W. 1, or it may be inspected in the Library of the Institution of Gas Engineers, 28, Grosvenor Gardens, S.W. 1.



Jubilee Illuminations

Birmingham's Contribution to the Forthcoming Celebrations

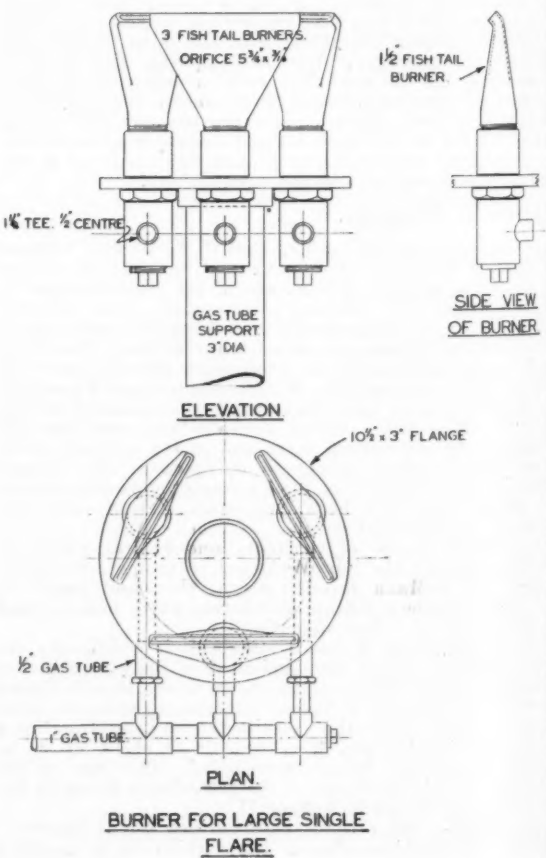
We are indebted to Mr. A. W. Smith, General Manager and Secretary of the Birmingham Gas Department, for this helpful description of an effort to produce an effect which is unmistakably characteristic of gas and quite impossible to obtain by electricity.

In connection with the forthcoming Jubilee Celebrations a good deal of floodlighting of public buildings is being undertaken by the Birmingham Electric Supply Department, and the Gas Department have been invited to co-operate. It is felt, however, that ordinary straightforward gas floodlighting cannot be distinguished from electric floodlighting by the man in the street, and therefore an effort is being made to produce an effect which is unmistakably characteristic of gas and quite impossible to obtain by electricity. It is possible that other undertakings will be sufficiently interested to desire to accomplish something of the same kind, and if so, any further particulars which may be required will be gladly provided.

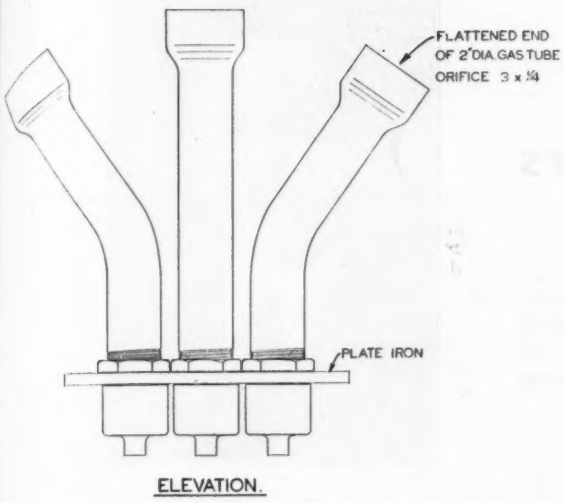
The idea is extremely simple, being merely the production of a large flame or beacon. Four of these large flares will be fixed on the roof of the Town Hall—one at each corner. The main body of the Hall is being floodlit by the Electric Supply Department, and it is hoped and anticipated that the flares on the roof will add materially to the spectacular effect.

In addition, it has been decided to illuminate the front entrance, gateway, and tower of the new Birmingham Fire Station, which is now nearing completion, but this will be carried out in a somewhat different way. At the extreme top of the new tower a triple flare, suggestive of the Prince of Wales' feathers, will be fixed. Large pylons, about 15 ft. high, are being temporarily constructed, and will be erected at a distance of about 20 ft. from the front wall of the building. On the top of each pylon (which will be of a design to conform with the character of the building) a large gas flare will be fixed. Smaller flares are being fixed at the level of the eaves of the main building—one at each side of the tower.

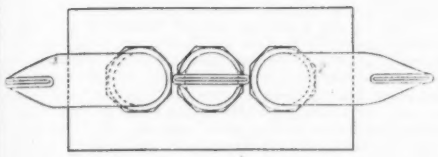
To obtain a really good effect in the case of the largest flares it has been found necessary for these to consume as much as 6,000 c.ft. per hour each, and merely as a matter of convenience the gas supply for them is being taken direct from the high-pressure main which carries gas at a pressure of 15 lbs. per sq. in. As this supply is easily available it has been necessary for only comparatively small pipes to be run to deal with this quantity of gas. In positions where such a supply is not available it might be desirable to use temporary fans for the purpose.



BURNER FOR LARGE SINGLE FLARE.

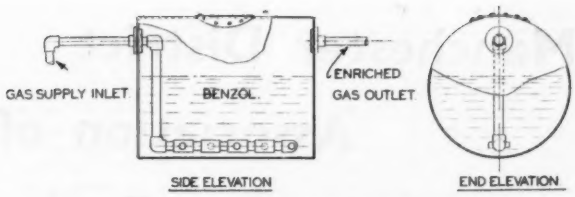


ELEVATION.



PLAN.

BURNER FOR PRINCE OF WALES PLUME.



CARBURETTOR TANK.

The form of burner used for the large flares is shown on the accompanying drawings, and also the burner used for the triple flame. Photographs of the two flames taken by night are also reproduced.

It was found that the effect of carburetting was materially to improve the brilliance of the gas flame, and this is carried out in a very simple manner, by providing a container, which is in reality a hot water cylinder of about 50 gallons capacity and which, of course, has been tested for strength and soundness. This container is partly filled with benzole, and the gas to be used in the flares is bubbled through the spirit before being piped off to the burners. The gas is thus easily enriched, and as a matter of fact it is found advisable to dilute the stream of enriched gas by means of a by-pass round the carburetting tank, as otherwise the consumption of benzole is rather higher than is altogether necessary.

It is anticipated that one gallon of benzole will be sufficient to carburet 1,000 c.ft. of gas, and therefore the quantity of benzole required is easily arrived at.

Social Events

Kilmarnock Gas Department Re-Union

The annual social and dance of the employees of the Kilmarnock Corporation Gas Department, which was held in the Art Galleries on March 8, had a special significance. It marked the fiftieth annual re-union of the kind. A large company included members of the Utilities Committee, Corporation officials, and employees and their friends. Ex-Bailie John Lamont, Convener of the Gas Committee, presided, and was supported by Provost Henry Smith, Treasurer J. H. Carnie, Bailies James Bryce and R. M. Hood, Councillors Alex. M'Cubbin and Robert Edgar, Mr. James Muir, Galston; Mr. William Brown, Mr. Robert Fife, Engineer and Manager of the Gas Department; Mr. N. J. Campbell, Town Clerk; and Mr. James A. Scott, Town Chamberlain.

After supper the Chairman extended a cordial welcome to the guests and made fitting reference to the death of Mr. Charles Fairweather, the late Engineer and Manager.

Mr. James Muir, Galston, a former employee of the Kilmarnock Gas Department, proposed "The Gas Undertaking."

The Chairman, in replying to the toast, said that the Kilmarnock Works had made rapid strides forward since the time Mr. Muir was associated with him.

The toast of "The Public Utilities Committee" was proposed by Mr. Fife.

Western Junior Gas Association

Meeting at Bath

The March meeting of the Western Junior Gas Association was held in the Showrooms of the Bath Gas Company on March 16. A new departure was introduced at this meeting, which took the form of a Question Box and proved very successful.

A Paper containing fourteen questions was previously circulated to all members, and at the meeting these were frankly discussed in turn.

At the conclusion of the meeting Mr. J. Wesley Whimster (Engineer and Manager of the Bath Gas Company) presented prizes for Papers read by members, as follows:

Session 1932-33.

1st Prize.—Mr. A. Marsden for his Paper entitled "Observations on the Distribution of Ash in Coal and Coke."

2nd Prize.—Previously presented.

Session 1933-34.

1st Prize.—Mr. K. L. Clark for his Paper entitled "Gas Services and their Protection from Corrosion."

2nd Prize.—Mr. A. R. Langford for his Paper entitled "Methods of Reducing the Number of District Complaints."

Manchester District Association of Gas Engineers

65th Annual Meeting

The 65th Annual Meeting of the Manchester District Association of Gas Engineers was held at the Midland Hotel, Manchester, on Friday, March 22—the President, Mr. F. G. SHAW (Buxton), being in the chair at the outset.

THE NEW PRESIDENT.

Mr. A. L. JENNINGS.

Mr. Arthur L. Jennings served his apprenticeship in general engineering with Messrs. Clayton, Son, & Co., Ltd., of Leeds, being with this firm for seven years. In 1907 he was appointed Assistant Manager at the New Wortley Works of the Leeds Corporation Gas Department, which position he held for five years. In 1912, Mr. Jennings became Engineer and Manager to the Cleckheaton Gas Department, where he was engaged in the designing and construction of the Gas-Works on a new site. Three years later, the amalgamation of local urban districts brought about a change of name to the Spenborough U.D.C. and further resulted in the absorption of two adjacent Gas undertakings Mr. Jennings is a representative for the Yorkshire District on the Central Executive Board of the National Gas Council and the Central Committee of the Federation of Gas Employers, while he is, in addition, a member of the Committee of Management of the Institution of Gas Engineers' Benevolent Fund. He is also Hon. Secretary for the Yorkshire District of the British Road Tar Association.

During the course of the preliminary luncheon proceedings the Secretary, Mr. J. BRIDGE (Elland), read the following telegram from Mr. Valon Bennett, the President of The Institution of Gas Engineers.

> "Much disappointed to say severe chill with high temperature prevents me attending luncheon and meeting. Please offer my sincere regrets and apologies and accept my best wishes for successful meeting and continued progress of Association."

Enthusiasm.

The PRESIDENT said that one of his friends who was not connected with the Gas Industry in any way, but who attended the October meeting of the Association, was good enough to remark upon the enthusiasm and the devotion that the Industry was able to inspire in those who directed its fortunes. He stated that it was indeed a revelation to him, and that he was very forcibly impressed not only with the importance of the Gas Industry but also by the energy, keenness, and ability of the members of the Association in forwarding its interests. His friend was again present upon that occasion, and it was to be hoped that he would again observe the enthusiasm he had noticed upon the former occasion.

What was the real secret of the great enthusiasm and confidence that gas engineers had in their product? To his mind, the reason was that they made and distributed the most efficient known means of delivering heat energy from a manufacturing works to the consumers. There was undeniable evidence that the utility and advantages of town gas were being recognized more fully in quarters where they could really be expected to know. He would quote from *The Engineer* of Jan. 25. In an article on the selection of a factory site, under the sub-heading of Power Supplies and Service, the writer began with the subject of gas. He stated: "Coming now to the external power supplies, this may be the ruling factor in deciding the choice for a site. It will usually be found that gas undertakings are willing to do all in their power to help a prospective customer buying in large quantities."

On behalf of the Association he wished to extend a hearty welcome to their guests. They were particularly pleased to have with them as their guests from Spenborough the Chairman of the Council, Mr. R. N. Hartley, J.P., the Chairman of the Gas Committee, Mr. E. Saxton, and several other members of the Council and friends of Mr. Jennings, as well as an old friend of his own in the person of Mr. J. H. Linfield, the Clerk to the Spenborough Council. He was quite sure they would be able to convince their good friends from Spenborough how much they honoured their President-elect, Mr. A. L. Jennings. There were also present the Chairman and Vice-Chairman of the Buxton Gas Committee, whom they thanked for their kind reception and entertainment at their previous meeting in July. He very much regretted that they were not able to extend a welcome to the President of The Institution of Gas Engineers. During his own period of office on the Council of the Institution he had been very greatly impressed by the work that was done by that organization not only at the present time but also in the past, and he had always had a very keen appreciation of the share taken by Mr. C. S. Shapley in laying the foundations of the Institution as they knew it to-day. Following him was Mr. R. E. Gibson, a Past-President whom they were delighted to have among them that day. The Senior Vice-President of the Institution, Colonel W. M. Carr, O.B.E., T.D., had consented to address them at quite short notice in the absence of Mr. Valon Bennett. He desired to avail himself of the opportunity, on behalf of the members of the Association, and in the presence of their guests, of saying how proud they were of Colonel Carr's eminence in the enginering world and in the Gas Industry, and that they thought with pleasure of the honour that was going to be conferred upon him in June of this year.

Regrets at the Institution President's Absence.

Colonel W. M. CARR (Stretford) said that he would be negligent in his duty if he did not first state how extremely sorry the President of The Institution of Gas Engineers, Mr. Valon Bennett, was at not being able to attend the meeting. He had spoken to him on the telephone before nine o'clock that morning, and Mr. Valon Bennett's words were: "I hope you will tell the members of the Manchester Association how bitterly disappointed I am that I am unable to come to Manchester to-day." Unfortunately he contracted a chill at Birmingham while attending the District Association meeting there, and he was still confined to bed. He was sure it would be the desire of the President and of all the members of the Association that a message should be sent to Mr. Valon Bennett regretting his indisposition and expressing every good wish for his speedy restoration to health in view of the very important duties which were awaiting him. Mr. Valon Bennett was feeling the great burden of illness at the present moment, and he was sure they all sincerely hoped that it would be merely temporary.

Colonel Carr thanked the President of the Association for his kind references to himself. He was proud to be in the office of Senior Vice-President of the Institution, and he was also proud of the fact that that honour had been given to a member of the Manchester District Association of Engineers which he regarded as his parent body, because he believed he was actually a member of the Manchester Association before he was privileged to become a member of The Institution of Gas Engineers.

Had Mr. Valon Bennett been present he would probably have said something about the progress of the Industry. The President (Mr. Shaw) had indicated, and rightly indicated, that the Gas Industry was one of the foremost

industries of the country; in fact, he would go so far as to say that it was the foremost industry in point of view of national importance, having regard to the fact that our national wealth was coal. He had made that remark previously, but he made no excuse for making it again. They were on the eve of great developments. The eyes of the man in the street had been turned in the course of the last 20 years, for political reasons, and others, to the statement that the great public utility of this country was going to be the electrical utility.

The Supplier of Heat.

The electrical utility was a great public utility, and it was a great supplier of light and power. It was not, and could not ever be, the supplier of heat for industry and domestic purposes that the Gas Industry was, and was going to be in increasing measure in the years to come. Considerable technical advancement had been made in the Gas Industry, but unfortunately its commercial advancement had perhaps lagged a little behind its technical advancement. They had learned to manufacture and produce economically. Thanks to restrictions which were imposed upon them many years ago they had been restrained from developing their commercial activities as applied to the selling of the product that they manufactured. They had been restrained by fixed flat rate charges bearing no relationship to the cost of supplying a particular load. Those charges were designed when gas was sold only as an illuminant. To-day, the gas sold for illumination purposes was relatively small compared with that which was sold for cooking, heating, industrial, and manufacturing purposes. Although he was naturally a firm believer in gas lighting, certainly exterior lighting, he realized also the convenience that electricity had for interior lighting. He realized also that to-day there was very little difference in the cost. All those who were engaged in the Gas Industry realized, however, that in regard to other fields of activity they themselves had an enormous advantage. Electricity was not a competitor in the heating field.

A big problem confronted them as an industry—the greatest problem of the nation—and that was the elimination of smoke. Eventually the day would come when the President of their Association, or a President of The Institution of Gas Engineers, would address such a meeting as he had the privilege of speaking to that day, and he would be able to say: "Gentlemen, I am proud to say that there is no fuel being used other than clean gaseous fuel in this country." This was not a far-away picture. He was not an idealist; he was a practical Gas Engineer, and every day he lived he was more convinced of the truth of the remark he had just made. How was it going to be brought about? They had been given a certain measure of freedom in that they were going to be able to put optional methods of charge into operation. They were all of them at the moment assiduously investigating how they were going to give consumers the benefit of that freedom, and how they could re-design their charges to enable them to permit consumers to replace the solid fuel with which they were polluting the atmosphere by a clean fuel at a cost which in total was going to be no greater to themselves. The additional load that was required to replace that solid fuel could, in fact, be supplied when they were able to design their charges and tariffs in proper form. Their produce could be supplied at a cost which did not exceed the total fuel bill of the house to-day. There was no necessity for smoke, and his friends from Buxton would probably find, when the work was completed, that there might be less demand for their magnificent clinics, and he was sure they would not have regrets when that happy consummation was reached.

The Re-Housing of the Nation.

The Gas Industry were the people who had to take the primary move, and who had to convince the public of this country that they could solve the most important problem with which they were confronted to-day—namely, the elimination of domestic smoke. Progress was being made. True it was slow, since what he would call the re-housing of the nation had been commenced. He would call it the re-housing of the nation for want of a better word. Perhaps immediately after the war they had made substantial progress. Gas was being more and more extensively used in houses, and in the case of the area in which he worked he was proud to say that they had just secured the business of 500 houses in which no solid fuel that would create smoke, no raw coal, would be burnt. There would be a solid fuel fire which would be a coke fire, provided with a gas-fired cooking oven. There would be electricity for lighting.

They were a little hampered in the case of the building estates. The builder could buy a cylinder very cheaply. He could buy what was called a back boiler to go into the grate very cheaply. He built the houses for sale, and he had to be convinced that an installation which might be going to cost £7 or £8 more than his first cost was something which he ought to undertake. It was a point upon which he thought local authorities could render enormous assistance to the Industry with great advantage to themselves and the public whom they represented. The heating question in the case of houses had been dealt with in all too casual a manner. Take the case of the great Corporation of Manchester, in whose city they were then holding their meeting. He lived, personally, in an area of Cheshire which had been recently absorbed, and not far away was the great housing estate of Wythenshawe. Coming down from the higher ground in Stockport it was a perfect scandal to see in the early morning, as he saw it the other day, the smoke pall hanging over the new housing estate. What was a beautiful rural area had been absolutely destroyed because their administrators had not yet learned the crime of the pollution of atmosphere. There was no necessity for the smoke pall over Wythenshawe. He ventured to make that utterance in Manchester, and he hoped the public administrators in Manchester might each of them some morning travel out, as he did, and look over from the high ground coming from the direction of Derbyshire, and see what he saw. They would then realize what a mistake they had made.

Need for Courage.

They had got the works, they had got the plant, they had got the technical brains; all that was necessary to do was to have the courage to make use of them, and they, as an Industry, must have the courage to go forward with a progressive policy. They had got to take a risk, and even their municipalities had got to say they were going to take the risk of commercial loss. What did commercial loss matter if they cleaned the atmosphere? He was quite certain, however, that there would be no commercial loss; it was merely a case of the education of the public, the man in the street, that they were a public utility of the country that was anxious to render this service to the nation.

He had dealt with the domestic aspect, in the main, so far as the future of the Industry was concerned. Of that future, provided their policy was right, and provided they themselves had confidence and courage, there could not be the slightest doubt. So far as industry was concerned he had made that morning a small sub-division of the industrial load they had in Stretford. It was rather interesting to notice, in analyzing that load, that of the industrial gas sold, which this year would exceed 340 million c.ft., 35·5% was used by the general engineering and electrical industry; 15·5% by foodstuff manufacturers; 12% by manufacturers of building materials; 10·7% by special heat treatment processes in what he termed indirect manufactures, such as glass work and chemical work—by chemical work he meant small laboratory work and furnace work which could not be directly assessed; 6·8% in chemical works; 5·5% in the manufacture of oil paints and varnish; and 14% in miscellaneous trades other than those he had mentioned.

It was likely that within the next month the figures that he had given would be out of proportion, and that in the list he would have to include a very high percentage for the steel industry. That was not only going to take place in Stretford, but it was going to take place in every manufacturing town in Lancashire and Yorkshire, and, in fact, in every industry in the country, because wherever they had been able to render the manufacturer a service he did not go back to the old state of affairs but came to them again. Manufacturers would come in increasing numbers, and therefore not only was he confident of the domestic future, but he was confident of their future as the principal supplier of industrial heat.

The President had rightly called attention to the fact, and it was growing and growing, that the selling of cheap industrial gas enabled them, in turn, to get such an output and such a load factor which permitted them to give better rates to their domestic consumers than they were able to do without those industrial sales.

Colonel Carr thanked the President and the members for receiving him in Mr. Valon Bennett's place, and, in conclusion, he could only say how sorry he was that that gentleman himself could not be present. It was the only Association meeting he had not attended during his year of office.

The Annual Meeting.

Upon the suggestion of the PRESIDENT, it was decided that the Secretary should write a suitable letter to Mr. Valon Bennett conveying the sympathy of the members and hopes for his complete and speedy recovery to good health.

The PRESIDENT referred to the loss that the Association had suffered by the death of Mr. H. R. S. Williams, of

Altrincham, and the members stood for a moment in silence as a tribute to his memory.

The PRESIDENT extended a hearty welcome to Mr. Arthur Roberts, the President of the Midland Association of Gas Engineers, to which that gentleman briefly responded.

The following new members were elected:

Mr. C. H. Bamber, B.Sc., Engineer and Manager, Gas-Works, Rochdale.

Mr. G. R. Macfarlane, Engineer and Manager, Gas-Works, Nelson.

Mr. J. Winson Scott, Messrs. R. & J. Dempster, Ltd., Newton Heath, Manchester.

The Annual Report and Statement of Accounts was then presented and unanimously approved.

REPORTS OF COMMERCIAL SECTIONS.

Yorkshire Section.

Mr. E. H. HUDSON (Normanton), in moving the adoption of the Report of the Yorkshire Commercial Section, said that he did not want to occupy the time of the members by enumerating the good work that Yorkshire did. The Report had been circulated, and notes could be compared. He had to thank the Yorkshire members for their loyalty to the Industry, and to the unwritten laws of the Association. They had no trouble in Yorkshire.

Mr. C. S. SHAPLEY (Leeds) seconded the adoption of the Report, and the motion was carried unanimously.

Lancashire Section.

Mr. E. CROWTHER proposed the adoption of the Report of the Lancashire Section, saying that he was not prepared to discuss it at length, as there had been certain reorganizations with regard to the Committee and so forth. He regretted that the newly appointed Chairman was not able to be present owing to ill-health.

Mr. G. S. FRITH (Runcorn) seconded the adoption of the Report, which was carried unanimously.

Contribution to Institution Benevolent Fund.

It was unanimously resolved to contribute the sum of ten guineas to the Benevolent Fund of The Institution of Gas Engineers.

It was proposed by the PRESIDENT, seconded by Mr. E. H. HUDSON, and unanimously agreed, that Mr. A. L. Jennings be elected to represent the Association upon the Council of The Institution of Gas Engineers.

On the proposition of Mr. S. CARTER (Liverpool), seconded by Mr. N. HUDSON (Mirfield), Messrs. E. Crowther (Salford) and H. Burton (Shipley) were appointed representatives of the District Association on the Councils of the Manchester and District and Yorkshire Junior Gas Associations respectively.

The New President.

The PRESIDENT said that it was now his pleasing duty to induct Mr. A. L. Jennings as President of the Association. Mr. Jennings had won for himself the esteem of a wide circle of professional friends, and particularly of members of the Association. His work as Engineer and Manager of the Spenborough Undertaking had been most successful, and his all-round experience would stand him in good stead in the office of President of the Association. His work as President of the Association would be made a labour of love by the generous assistance he would at all times receive from the Secretary, Mr. James Bridge, by the Council of the Association, and the support of the Members.

Mr. A. L. JENNINGS was then invested with the Presidential Badge, and after speaking in glowing terms of the services rendered to the Association by his predecessor, Mr. F. G. Shaw, he presented that gentleman with the badge of a Past President.

Mr. F. G. SHAW said that when he gave his Presidential Address the previous year he expressed the hope that the clouds which were hanging over the Industry would soon begin to show a little of the silver lining. He was glad that there was a little of that hoped-for improvement now in evidence, and it had been duly taken advantage of by the Industry. He would also like to add that he was very grateful for the admirable way in which the Press had reported the meetings of the Association.

Presidential Address of Arthur L. Jennings, Spenborough

At the outset I wish to express my appreciation of the great honour which you have conferred upon me in electing me as your President; for so doing I sincerely thank you. The long history of this Association and the high qualifications of many of its previous Presidents impose no light responsibility on each succeeding holder of the Office. This, however, acts as a spur, and therefore during my year of office I shall make every effort to discharge its duties adequately and to be of service to you. This I know would be quite impossible without the assistance of the Immediate Past-Presidents, the Executive Committee, with our excellent Hon. Secretary, Mr. Bridge; and on their whole-hearted support I feel sure I can rely.

The Spenborough Council Gas Department.

I do not propose to weary you unduly with lengthy particulars regarding the Spenborough Gas Department, but will briefly outline its being and activities.

It existed in 1837 as a small Company which in 1870 was acquired by the Cleckheaton Local Board. Amalgamation of three local and adjacent Urban District Councils—namely, Cleckheaton, Liversedge, and Gomersal—took place in 1915 under the new title of the Spenborough Urban District Council, which resulted in three Gas Undertakings operating in its area, and largely outside it.

The Heckmondwike and Liversedge Gas Company and the Gomersal Gas Company were therefore acquired by the Council in 1921. The Gomersal Gas-Works was closed and the Heckmondwike Gas-Works, which is capable of a gas output of one million c.ft. per day, operates only when the Cleckheaton Gas-Works is unable to deal with the load.

The Cleckheaton Gas-Works was built by me on a new site as a complete new works in 1914, the Woodall-Duckham vertical retorts then installed being about the second installation of this type existing in the North of England. At the time of the taking-over of the two before-mentioned Gas Undertakings in 1921, compressors were installed at Cleckheaton Gas-Works and 3 miles of 5-in. welded steel high-pressure gas main were laid to Gomersal Works, also 3 miles of 8-in. similar main to Heckmondwike Works, for supplying gas from Cleckheaton into their holders.

A unique feature of the Cleckheaton Works is that it has only one gasholder there, but it is connected up to a further six at the other works by the before-mentioned high-pressure mains.

A benzole plant is installed and the Works is now gradually being enlarged.

The yield of gas for this year is 90 therms per ton of coal, after correction for benzole extraction. It is interesting to record that when Heckmondwike Gas-Works worked in 1932-33 it produced for the year 15,888 c.ft. of 463 B.Th.U. quality gas—namely, 73·6 therms per ton of coal—by despised inclined retorts.

The total gas made last year at 335 million c.ft. constituted an increase of 5·5% on the previous year. This financial year, at the end of September there existed a further increase of 5·6%, but owing to the mild winter this has been nearly all lost, being only 1·9% at Dec. 31 last.

The area of supply is the largest in the country administered by an Urban District Council, and three electrical undertakings operate therein. The district can be regarded as mixed industrial—the volume of gas sold at industrial price being 38%.

The prices of gas may be interesting, as they are varied to attract various usage.

Net Prices per Therm. Pence.

Industrial, scale from 6·3d. down to 3·6d., all such gas in excess of 2,250 therms per month being at the lowest price.

Gas Engines (after 20 therms per month), 3·6d.

Fish-Frying, Sugar Boiling, Vat Heating, scale from 5·25d. to 3·6d.

Central Heating and Storage Circulating-Water Systems, 4·0d.

Lighting and Domestic Purposes, 9·5d. first 18 therms per quarter, balance 6·65d.

Quality. Declared 450 B.Th.U. Supplied 460.

Converting the salient figures of the foregoing into per 1,000 c.ft. basis it will be seen, therefore, that, notwithstanding interest and loan charges of 12½d. per 1,000 c.ft., the selling prices of gas for industrial purposes and gas engines are as low as 16½d., for central heating and

Reason upon Reason— for installing W-D CONTINUOUS VERTICAL RETORTS

MODERN RETORT HOUSE DESIGN

GOOD WORKING CONDITIONS

HIGH WASTE HEAT RECOVERY

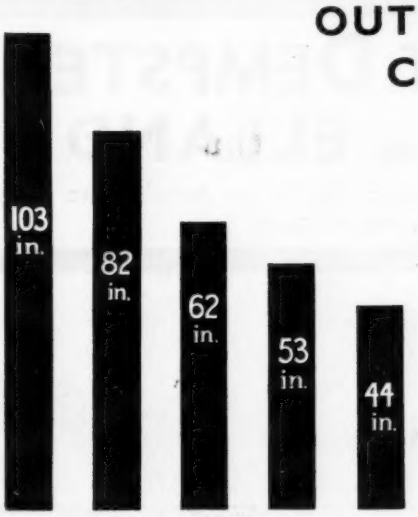
IMPROVED COKE PRODUCTION

EASY & ACCURATE CONTROL

HIGH THERMAL EFFICIENCY

LONG LIFE—LOW MAINTENANCE

MAXIMUM FLEXIBILITY OF OUTPUT AND CALORIFIC VALUE



Five retort sizes ensure flexibility combined with economy, in works of every size.

Each retort is a separate heating and scurfing unit.

The output of each retort can readily be governed down to 50% of its nominal capacity.

Easy steaming control ensures flexibility as regards calorific value.

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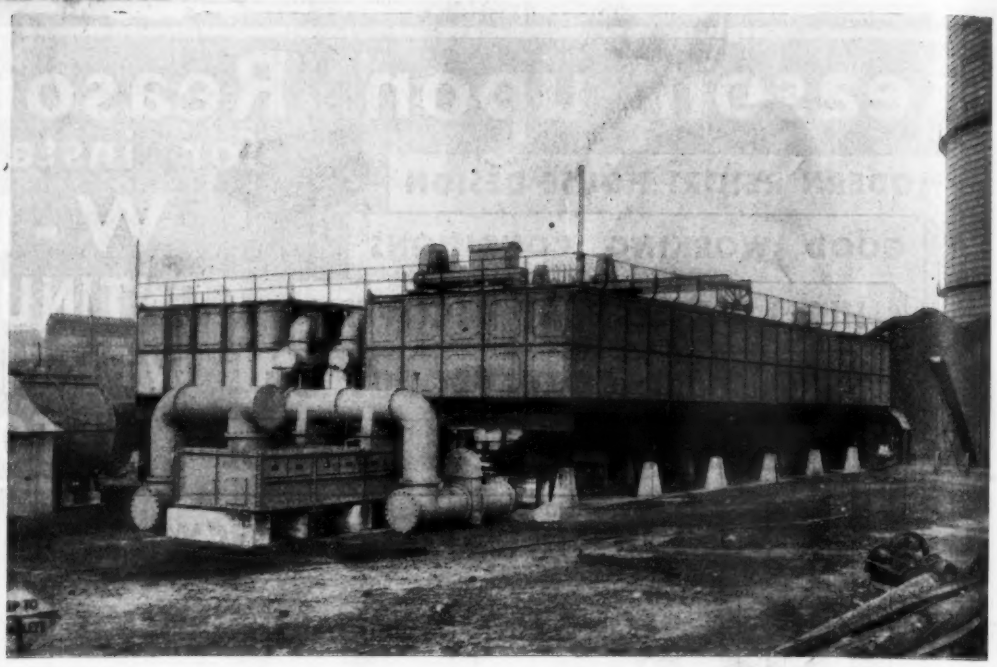

Two Sets of four PURIFIERS, 25 ft. x 25 ft. x 10 ft. deep, on Joist Structure, with Travelling Oxide Handling Plant, erected at the Gasworks, Vancouver, British Columbia.

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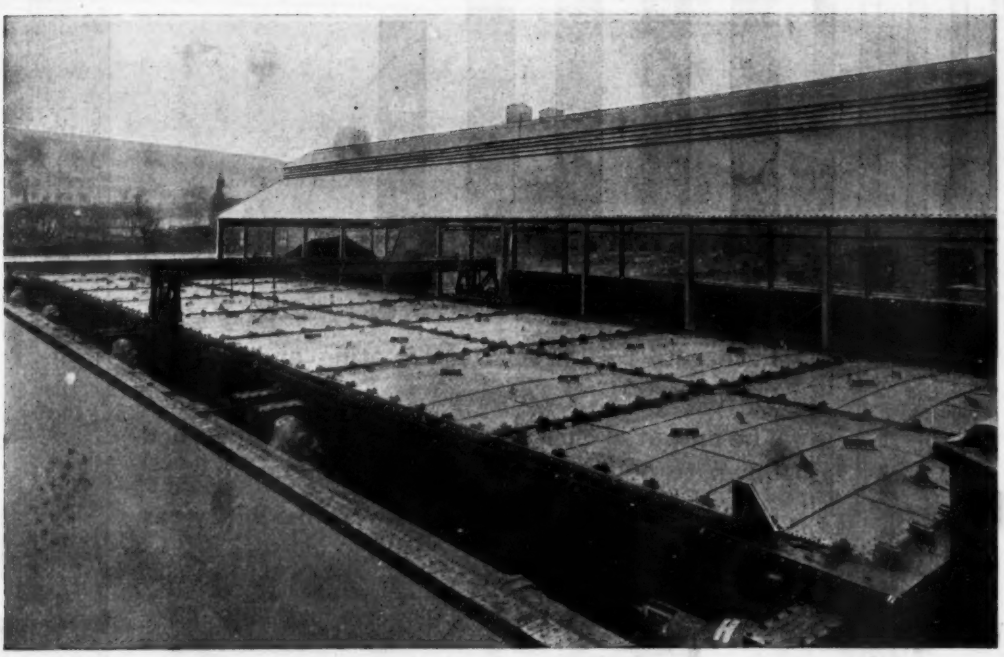


Four Purifiers 30 ft. 0 ins. square x 5 ft. 6 ins. deep, fitted with single Weck Valves and DEMPSTER'S MAIN REVERSER VALVE for reversing the flow of gas in all four Purifiers, erected at the Gasworks, Barnsley.

circulating-water systems all at 18d., for fish-frying, &c., commencing at 23½d. per 1,000 c.ft.

An index of other items which may be of interest is:

Benzole yield, 2·3 gallons of 77%.

Bonus paid on gas appliances sales—apply to meter inspectors, distribution foremen, gasfitters, and mainlayers—2s. 6d. per cooker, 2s. per fire, and 1s. 6d. per washboiler.

Bonus to maintenance examiners, 1s., 9d., and 6d. respectively.

New property does not rank for bonus.

Of gas appliances sold last year, 30% ranked for the bonus before-mentioned.

Number of consumers, 13,060; 8,060 being automatic meters.

Rentals are now charged for automatic meters.

Price of gas registered by automatic meters is the same as that by domestic ordinary meters.

Industrial Salesman.—The appointment of such appears likely to prove remunerative and an early decision is pending.

[The appointment has been made since this Address was written.]

Simple-hire cookers, with replacement by new at the end of 8 years, at rental of 5s. per quarter—all-enamel, plate-rack, thermostat, 4-loaf oven size. Recently initiated such hiring with promising results.

This information may be of service to some, of interest to more, and deals sufficiently it may be considered with the activities of the Spenborough Gas Department.

Believing that it is likely to be more acceptable to members it is not proposed in the remainder of this Address to exploit at length any particular theme or branch of the Industry's activities, but rather to examine the domain, the estate, of the Gas Industry as a whole. In this regard the present and future constitute the soils which are most profitable to examine or cultivate, but the past is not barren ground, and brief examination of this soil is helpful both for the present and the future.

Coal.

The amount of energy which has been devoted to the advancement of carbonizing practice during the last 30 years has raised it to a high standard of efficiency, but most of the systems have caused great demands for certain grades of size in coal which has had the tendency to keep up the price of those classifications. For this reason more concentration appears to have been desirable in establishing carbonizing systems which could efficiently deal with any class of size in coal, including slacks in particular, and possessing flexibility to do so. This would have allowed of full advantage being taken of the use of any grade of coal which happens to be comparatively the cheapest at any particular time. The use of nut graded sizes of coal by a gas-works may result in a high yield of therms per ton, but the nearest possible approach to balancing the coal bill by receipts from residuals can only be attained by the employment of slacks, unless there are very unusual local circumstances to the contrary. The use of slacks does not by any means imply that a high ash content is a corollary.

The Industry has concentrated on economies in the main river of carbonization practice with such good result that research in other directions appears likely to be more lucrative, and it will have to fish the smaller streams to lower its costs more effectively. Part of those particularly referred to lie in the manufacture of gas, and part in its distribution. In the former category are water and benzole, and in both rating.

Water.

The cost of water in many gas-works is one which can easily be overlooked in that by the very nature of things it is natural to infer that it is cheap and its cost negligible. It can easily be neither. The use of vertical retorts results in gas entering the condensers at a much higher temperature than is the case with horizontal retorts; consequently the gas from the former requires a material increase in the quantity of water used for cooling purposes, assuming water tube condensers are used. When vertical retorts are used in conjunction with water-tube condensers as the only medium for condensing, a large volume of water is usually run to waste, even if the hot water is used for boiler purposes.

The crux of this matter is that a large number of gas-works have condensers which are too small but the fact is not appreciated, nor is it realized that the extension of the condensers will naturally increase efficiency and decrease the water used. To prevent this waste the installation of new atmospheric condensers is a palliative, but only very slightly so, and extension of the water-tube condensers to run in series, as to both gas and water, with the existing ones is a much better proposition, particularly if water coolers are introduced. Where the cost of water is high the sinking of a water bore-hole is more generally a commercial proposition than is usually recognized, and regard should be given to the fact that the water from a bore-hole is much colder, and therefore more suitable for condensing purposes, than town's water, which during the past summer was distributed in some towns at a temperature as high as 70° F.

The fitting of thermostatic control to condensers is a practice which the Industry is slow in adopting. This is hard to understand in view of the economies in water and regularity of gas outlet temperature which such appliances can effect.

Benzole Extraction.

The extraction of benzole in gas-works is a process which has been widely adopted in recent years, but not to the extent which it deserves. Whatever system of carbonization is in vogue, including verticals, extraction should be undertaken by every gas-works, excepting only the very small ones, not only as a National duty to produce Home spirit, but owing to the fact that it is a commercial proposition as long as the Government continues its present policy of leaving benzole free of duty. The extraction of benzole is equivalent to an increased gas output of about 3½%, surely an incentive of itself for its installation. This is encouraged by the fact that various contractors offer reliable thermostatically controlled continuous extraction plants at prices which do not make their cost of installation high or operation costs other than light. It is well to stress the fact that if such benzole is not rectified it should be sold to the National Benzole Company and not to motor users in its unfinished state.

In referring again to the remuneration which gas undertakings obtain by benzole extraction it should not be overlooked that the cost of the extra 3½% of gas required to be made for its extraction should be included with the other costs debited to the benzole plant and that it remains a commercial proposition so long only as the Government continues the product as being duty free, as previously stated. The Gas Industry is called upon to take its full part in producing this Home spirit, which constitutes in time of peace an alternative to British money being sent abroad, greater coal output, and therefore greater prosperity for the coal mines and miners, and in time of war a certain and sure safeguard.

Rating.

The complexity of this matter is a subject in itself. Perhaps that is why it is so frequently neglected by those who control gas undertakings. It may be that the lead is given by municipal undertakings. In many of these the rating of the gas department is looked after, or is supposed to be so, by the Borough Accountant or an Official who constitutes his equivalent, such person being also the Rating and Valuation Officer. Thus the same person is acting in the dual capacity of bringing money into the coffers of the Municipality and in seeing that certain of its departments do not pay too much into those coffers. We have learnt from the earliest Book that a man cannot serve two masters. Apparently this figuratively implies two masters whose interests are opposed. Surely it is as hard for such an official to obtain the rights for both sides as it is for one lawyer to act jointly for a plaintiff and a defendant in the same legal case. This being so, it is reasonable to infer that fair rating of the gas department cannot be obtained. It either gains or, what is likelier, it loses, the Rating Officer regarding it as being money out of one and into the other Municipal pocket, and as all being the same in the end to the ratepayer. But is it all the same in the end? A small mill-owner may use a very large quantity of gas, and if the gas department is overrated this mill-owner pays more for his gas than he should. By the overcharge on the gas department rating this mill-owner's own rates are slightly lower than would be the case if the gas department were correctly rated, but a much larger mill-owner across the road, whose rateable value is, say, four times greater, obtains four times more relief, and his mill may not use any gas whatsoever. A clear case therefore is made establishing the necessity for gas department rating matters being controlled by the Manager of the Gas Department or by Experts acting on his instructions. This is likely to result in material reductions in the assessment of municipal gas undertakings.

Comparison of the amount of rates collectively paid by the various gas undertakings is interesting and helpful as

will be seen from the figures given below. These are extracted from the *Gas World* Analyses of Accounts for the year ended Dec. 31, 1932, for Companies and ended March 31, 1933, for Municipalities.

Rates Paid.

[English Undertakings.]

—	Per Therm Sold.	Per 1,000 C.Ft. Sold.
	Pence.	Pence.
Municipal—		
Published mean.	0·60	2·76
Highest	0·96	4·20
Near lowest	0·30	1·35
Difference, highest and lowest.	0·66	3·45
Companies—		
Published mean.	0·44	2·14
Highest	0·88	4·35
Near lowest	0·20	0·94
Difference, highest and lowest.	0·68	3·41

Briefly the above figures show that the highest rated Undertakings, both Municipal and Company, pay about 3·4d. more per 1,000 c.ft. sold than the lowest, which difference is a good dividend in itself if it were available as interest on capital or the equivalent.

The difference between the highest and the mean is over 2d. per 1,000 c.ft. sold in each case, and the general trend is that the Municipal Undertakings are very unfavourably rated as compared with the Companies. Actually the mean price of rates paid by the Municipal Undertakings per therm is 36% higher than the mean price paid by the Companies, which endorses the statement given at the outset of this subject to the effect that Municipal Undertakings generally are over-rated, due to the fact that their assessments are not properly looked after, thus setting the pace for the Industry as a whole.

Finally, those who maintain that the Rateable Value is the correct criterion for comparison will find that similar discrepancies exist, although possibly to a less extent, but the actual expenditure in rates is surely the phase which actually matters.

In making all these comparisons due regard is paid to the old maxim that the circumstances regarding various individual undertakings are so variable that individual comparison, regarding assessment and rates paid per therm or per 1,000 c.ft., is often unreliable. The collective difference, however, and its direction, is obvious.

Education.

The interest of the Juniors in the area covered by this Association in the Education Scheme is a record about which our Association is justified in being pleased in view of the fact that 49 students were presented with Higher-Grade Certificates at our last Autumn Meeting, and one student gained his Diploma in Gas Engineering. It is felt, however, in view of the wide area covered by the Association that a much greater number of students should avail themselves of this education than is the case, particularly in some parts of the area.

The Education Scheme in its curriculum constitutes a well thought out series of courses, extending over a period of years, on the part of the Institution of Gas Engineers and the Board of Education, but it is marred in that it is complicated to such an extent that students and most gas engineers cannot understand, much less remember, its various ramifications. This is a complaint which has often been made, and the time is ripe for its rectification. The answer to the effect that those who are responsible for administering and teaching under the Education Scheme consider it is perfectly clear is insufficient justification for not simplifying matters. Indeed, some persons have expressed the view that an extra year of study is necessary to understand the Scheme itself. While this view is extravagant, it points at the same time to drastic simplification being desirable.

The cumulative effect of this education is resulting in the staffs of gas undertakings being much better qualified adequately to discharge their various duties connected with the Industry they serve, and the heads of those concerns should use every possible means to encourage them to this end.

There is one aspect in connection with this subject of staffs to which it is necessary to draw attention. There exists in certain undertakings, fortunately very few, a definite reluctance on the part of the respective engineers to give testimonials to members of their staff when they apply for other positions, and to afford them adequate facilities for their attendance for interview on those occasions on which they are selected to do so. It is generally recognized that any man, whether he be a labourer or a manager, is entitled to ask for, and to obtain, from his chief a testimonial fairly setting out his qualifications and service, excepting only such persons as have been employed for only a few months, and further to give the necessary facilities for them to attend elsewhere for interview.

For chiefs to adopt a policy which is contrary to this is unfair. It does not conform to the treatment which they expected, and no doubt received, in their earlier days, and it results in dissatisfied staffs and employees, although this may not appear on the surface. It is to be hoped that thus drawing attention to the matter will help in this wrong being righted, rather than that its rectification should be further pursued from external sources.

Holding Companies.

The activity of Holding Companies in connection with the Gas Industry during the past year or so is a subject which has given much food for thought.

While the practice carried out by the Gas Industry during the last few years, by the absorption of small gas undertakings existing on the boundaries of much larger ones, constitutes a policy which has been generally approved, the activities of financiers in the amalgamation of sometimes adjacent, and often distant and isolated, gas undertakings is on an entirely different plane. Although at the outset their activities can benefit present holders of gas stock and those directly at the heads of the various concerns, they will result in ultimate stultification of the Industry unless they are controlled in such a way that the needs of the Industry come first and the interests of others after. The acquisition of Directors and Engineers on the Boards of Holding Companies is a step in the right direction, but in entering upon such positions they have a heavy trust to discharge on behalf of the Industry and more particularly with reference to its future. This trust the Industry looks to them to discharge by carrying out at the present, and in the future, the policy that the first interest is that of the gas consumer.

Whatever may be the merits of reducing costs by centralizing the production of electricity, that which applies to that Industry does not do so in the case of the Gas Industry. Reference to the Analyses of Gas Companies' Accounts shows, ignoring any gas supplied from coke ovens, that the lowest gross and net costs of gas into holder and the lowest selling prices of gas exist not in the largest gas companies, but in those of medium size. Rationalization of the Gas Industry is not comparable with rationalization of the electrical industry in that the costs of producing and selling gas do not show differences in favour of great undertakings in our case.

Coke for Domestic Consumption.

The suitability of the use of gas coke for domestic consumption is not appreciated by the public to the extent which is justified by its price or by its contribution to smoke abatement. No doubt this is largely due to the fact that the public have formed the habit of using coal as a solid fuel and regard coke as being inferior, just as they held the opinion when benzole was first introduced that this spirit was inferior to petrol. This view was held in regard to benzole because the public for a long time failed to adapt itself to its use; it took years to do so, but ultimately agreed that it was superior to petrol.

Opinion and usage had to be cultivated with regard to benzole, and the same no doubt applies to gas coke. It is desirable therefore to place before the domestic public an attractive proposition regarding the use of coke, and, in view of its penchant for discounts, a scheme embracing such seems to have the germ of success.

A method of application is in regarding the surplus coke shipped as alternatively available for local domestic consumption. A consumer of gas who uses 30,000 c.ft. of gas has had approximately 2 tons of coal used for its production, resulting also in the production of, say, 1 ton of coke for sale. If the consumer buys this ton of coke at yard price, his gas had been produced possibly 2d. to 3d. per 1,000 c.ft. cheaper than another similar consumer who leaves the coke as a surplus which the gas undertaking has to sell for shipping.

The use of a coupon attached to tickets for coke sold for domestic consumption entitling the consumer to a reduction in the price of his gas by an amount in pence per 1,000 c.ft. defined thereon, in the ratio of 2 cwt. of coke to 3,000 c.ft. of gas, allows of the coupon being filled in easily and quickly without additional staff, and also allows of the consumer attaching it to his gas account as part payment. If the consumer uses only 10,000 c.ft. of gas but his coke coupon gives him the right to discount on 30,000 c.ft. he does not obtain the discount on more than the 10,000 c.ft., as he cannot expect to receive it, for it relates to gas which he has not bought.

It is obvious that the total amount in value of discount thus given is bound to be less than the amount which would

otherwise be sacrificed if the coke were shipped, and if the application of the scheme results in keeping the gas-works free of stock it can further result in an increase in yard price, thus obtaining an increased price for the total coke output. The scheme requires certain safeguards. It is applicable also to automatic meter consumers, but its aim would be defeated if applied to coke used for industrial purposes or if a large percentage of the coke output from any particular undertaking is already used for domestic purposes.

Another method of applying the same scheme is to issue to such gas consumers with their accounts a coupon giving them an equivalent discount on coke, which they may or may not try to obtain. The disadvantage of this method is that a colossal number of discount coupons would have to be filled in, entailing an increase in staff to carry out the work, and the largest proportion would not be used; and if it were, sufficient coke would not be available. There is therefore the danger, by working the scheme this reverse way, of coupons for discount on coke being issued which could not be implemented.

Legislation.

It is to be deplored that recent legislation has not been successful in obtaining a minimum charge for gas supply. Concentration on obtaining this should be pursued at the earliest opportunity. There is no logical reason why the Gas Industry should not have facilities of charge equal to those enjoyed by its competitors, together with the legislative and financial opportunities applicable to them.

The establishment and operation of firms over a long period of years is usually advertised by them as constituting evidence of stability and reliability, but for some reason, which is not apparent, this qualification seems to be used as an argument against the merits and activities of the Gas Industry. Evidence of this is apparent, on the one hand, in the tardy recognition which the Government gives to the just claims of the Industry regarding legislation. On the other hand, the spell cast on the public by the word "Electric," as evidenced by the van which displays the words "The Electric Bakery" or "The Electric Laundry," reveals the interesting fact that to the public the word "Gas" conveys no such magic, and the public ignore the fact that for every one electric bakery or electric laundry there are thousands of both establishments which for years have used gas for their similar purposes more cheaply and more reliably, and, what is more, will continue to do so.

The Government cultivate this obsession in themselves and in the country, adopting towards the electrical industry the attitude that they regard it as a Bird of Paradise, and towards our Industry that it is a goose which lays golden addled eggs. The Gas Industry is a National one which rendered colossal production of explosive munitions in the Great War; and as it will be wanted for similar purposes sooner or later in the future, to stultify its activities is short-sighted for this reason alone.

It serves National needs in a rational manner and is entitled to Government recognition as one of the greatest and most successful National industries, which is capable of even greater achievements if allowed equal opportunity and freedom as that allowed its competitors.

Unit Basis of Charge.

The continued selling of gas per 1,000 c.ft. or per therm of 100,000 B.Th.U. is in the opinion of many responsible engineers detrimental to the interest of the Industry, mainly for two reasons. Firstly, both constitute a large unit when compared with the electrical unit. The Gas Industry sells its commodity in comparison at so much per yard and our electrical friends their commodity at so much per ounce. The public appreciate that there is a difference in the two bases, but to what extent they do not know. Secondly, the selling of gas on a directly comparable heat basis with the electrical unit will favourably illustrate the much lower comparative price of gas.

For these reasons it is to be hoped that the unit of sale for gas will be shortly lowered to a comparable basis. Whether it be called a "Unit" or a "Therm" matters little provided it conveys to the consumer the values of the commodities he buys.

If the electrical industry leads the Gas Industry in any particular it is in the fact that those concerned with its control have appreciated the advantages of varying methods of charge, especially in those fields where their commodity meets the greatest competition; and just as the heads of the Gas Industry have improved the efficiency of manufacture and distribution, so should they strive to increase the efficiency of gas sale price structures.

Gas Appliances.

The principle of the movement recently initiated by a member of this Association regarding the price and life of gas appliances is one which merits serious consideration for its advancement. Briefly, the opinion expressed by him was to the effect that gas appliances are too high in price because they are made to last too long, the useful life of an appliance being not when it ceases to be efficient but when it appears to be out-of-date.

The demand by the public for articles or appliances which last for two or three decades, with prices in proportion, is now the exception and not the rule. The acumen of certain gas appliance firms in co-operating has resulted in improvement in the desired direction, and it is possible, as an instance, to simple-hire very efficient all-enamel cookers, four-loaf oven size, at rentals of 5s. per quarter, which will allow of the cooker being replaced with a new one on similar terms at the time when it is likely to enter the out-of-date period.

During quite recent years there has been a vast amount of building of small houses having rooms so restricted in size that inadequate space is left to accommodate properly a cooker in the kitchen, or for fires, whatever the nature of their fuel may be, to be safely lighted in the bedrooms without burning adjacent furniture.

This small bedroom difficulty can be obviated by fitting a suitable gas fire in a safe place—namely, above bed level. With regard to the small kitchen, the partiality in the North of England for a kitchen range to be fixed in the kitchen as a matter of course is on the wane, and if this fact is impressed on builders in favour of a solid fuel mantel fixture, which can still embrace a fire-back boiler, the financial saving to the builder thereon could be utilized to provide adequate gas cooker accommodation. Attractive presentment of this proposition can result in mutual advantage to tenant, builder, and gas undertaking.

Generally.

The various aspects of factors connected with the Industry as dealt with in this Address are no doubt controversial in some cases. The views expressed in some of the other cases are not new, but they have been purposely reiterated further to concentrate thought and effort in their realization and application.

Before closing, I have to refer to very pleasant incidents connected with one of our recent Past-Presidents—namely, Colonel William M. Carr, O.B.E. The first is to express the hearty congratulations of the members of this Association on the signal honour which was conferred upon him by the King by the award of the Order of the British Empire, Military Division. Secondly, on his election to the Senior Vice-Presidency of the Institution of Gas Engineers. Without doubt both honours have come to him in recognition of the fact that he performs most excellent work in various directions in a thorough manner. We regard these distinctions as great honours not only to Colonel Carr but also to the Association. On behalf of the members of the Association I again congratulate him, wishing him long life to enjoy the first honour, and with regard to the second every success when he takes office as President.

In conclusion, the Gas Industry retains to-day the same supreme position as that which it has always held in the domestic field, and has materially advanced its position in the industrial field. With the extension of activities of its competitors the business which is available, if the competitors are to be at all successful, is naturally obtained to some extent by the competitors to the detriment of the Gas Industry. This is a natural consequence.

The engineering and commercial qualifications of those at the head of our various gas undertakings have never stood higher than they do to-day, neither have the efficiencies and designs of the various domestic and industrial appliances which the Industry has to offer.

The improvement in service and the concentration now employed in salesmanship together with the value of the commodity which it has to sell give the Gas Industry the right to hold the view that its present position is flourishing and its future bright. It is capable, and intends, to maintain and considerably to extend its present business, and is full of confidence that it can, and will, in the future continue to hold its position for a very long time as the Premier Public Utility Service existing in this country.

Having concluded my Address, I wish now to express my sincere appreciation and thanks to the Spenborough Council, its Gas Committee, and my Chairman, Councillor Saxton, for the strong support which they have given me for so many years, culminating in their kind co-operation in allowing me to take Office as President of this Association. It is a double pleasure for me to serve them and for me to be allowed to serve you.

An Invitation to Spenborough.

At the conclusion of the Presidential Address, Councillor E. Saxton (Chairman of the Spenborough Gas Committee) expressed the appreciation of the Spenborough Council,

and especially of its Gas Committee, of the honour paid to Mr. A. L. Jennings in electing him as President of the Association, and extended an invitation to the Association to hold its summer meeting at Spenborough.

Mr. F. G. SHAW accepted the invitation on behalf of the Association, and expressed the thanks of its members for the kindly feeling which had prompted it.

Votes of Thanks.

Mr. A. L. HOLTON (Manchester) proposed a hearty vote of thanks to Mr. Jennings for his extremely interesting and informative Address, in which he had expressed his opinions in a very outspoken manner.

Mr. J. E. LISTER COOPER (Yeadon) seconded the vote of thanks, which was carried unanimously by acclamation.

Mr. A. L. JENNINGS, in responding to the vote, said that if the Industry was to get its costs down on the manufacturing side it would have to do so in a lot of small things rather than in one or two big ones. After spending many thousands of pounds in improving plant a common result was merely to lower costs to the extent of, say, 1d. or 1½d. per 1,000 c.ft. In order to obtain business in the industrial field it would not be a matter of a reduction of 1d. or a fraction of a 1d. which would be necessary but one of sixpences and shillings. Anything which could be done to bring down costs to help the Industry to secure a large industrial business should be done. That business was available and only needed to be catered for.

Committee and Officers.

Mr. T. REYNOLDS proposed, and Mr. G. E. CURRIER (Bradford) seconded, that a hearty vote of thanks be accorded to the Committee and Officers for their services during the past year. The motion was carried unanimously.

Mr. J. BRIDGE (Elland), in responding, said that the discussions at the Committee meetings had been very helpful, and there had been a very great deal of work done during the past year, as was made evident by the length of the Report. Particular notice should be taken of those portions dealing with the Institute of Fuel and the Illuminating Engineering Society. He would be pleased to supply particulars of membership of those bodies to anyone who desired to receive them. The Auditors had carried out their duties in their usual efficient manner. He appealed for members to come forward and read papers during the coming year.

The proceedings then concluded.

A STUDY OF Workshops Practice

by J. L. CROSSLEY

In this Paper, read before the Scottish Junior Gas Association (Western District) on March 23, Mr. J. L. Crossley dealt with the work carried on at the Milan Street Depot of the Glasgow Corporation Gas Department.

The beginning and end of the Depôt is a loading bank capable of loading or unloading 10 vans at one time. All material is received at this point, and eventually in some form or another it, or its product, is despatched from the same place. Appliances which have become obsolete or which require modernizing and reconditioning are brought in from the districts. The vast number of appliances in daily use in the Glasgow gas area necessitates the replacement of a continual large quantity.

Cooking appliances in quantity have to be reconditioned and re-issued weekly. After being stripped of brass cocks they are packed in a gas-fired incinerator. All grease and foreign matter is burned to a crust at a temperature of 750° F. The incinerator is capable of holding in one batch 24 standard cookers with a large number of smaller appliances and parts. This treatment prepares the appliance for the next operation; it also destroys germs by therms.

Adhesions to the cooker having been converted into a dry crust, conditions are now suitable for cleaning by sandblast, which produces a casting perfectly clean and in many cases better than when new. The cooker now passes to the assembler who replaces or alters any necessary parts.

The process as applied to gas fires and radiators is similar to that employed with cookers, excepting that, largely owing to the absence of grease, these appliances are in a suitable condition for sandblasting without incineration.

After the completion of the operations described, the appliances are treated with paint or enamel, a surface most suitable for the purpose having been prepared as a result of sandblasting. During the process of painting the appliance is again operated on a turntable and sprayed through pistols by air pressure varying from 20 to 40 lbs. per sq. in. according to the finish required. The paint supply is maintained by the use of gravity cups.

To meet the requirements of this age of colour, advantage is taken of the almost endless possibilities of the paint spray. The Department produces gas fires in 50 different standard colour finishes, and in addition matches any particular colour scheme required by the consumer.

After enamelling, appliances pass to the testing room for examination and regulation before being accepted into stores.

In addition to reconditioning appliances, the workshops section of the Milan Street Depôt acts as a feeder to the stores for a large variety of fitments. It is responsible for the recovery of used tube and fittings. Old tube and fittings brought in from the districts are disconnected by a machine with specially adapted chuck and jaws, eliminating much expensive and tedious hand work. Old copper tube, after being disconnected, is straightened between the rollers of a specially constructed machine.

The plant includes machines for cutting, screwing, and reaming wrought-iron tube. Each screwing machine when operating on ½-in. tube is capable of producing 800 screws per 8-hour day and maintaining in stores a stock of every length from 2½ in. upwards. The dies used are of four separate sections, and these dies are made and tempered on the premises.

Sheet metal workers are employed in making flue pipe, gas fire surrounds, special heaters, and a variety of fitments. Other tradesmen and operators are necessitated through the large number of appliances and fittings required, particularly for industrial purposes and which are away from any standard pattern. Burners are made to measure in large quantities for use in the conversion of coal range ovens to gas.

Cookers of standard pattern and of up-to-date enamel finishes are assembled at Milan Street. These cookers are, when required, fitted with thermostatic oven controls and compare favourably with the most modern finishes without creating any difficulties in the replacement of parts.

Gas wash boilers are stocked in coloured enamel to match the cookers, thus completing an attractive kitchen suite, easily cleaned and of lasting appearance.

Testing Rooms.

Brass cocks and other fittings are tested under water by air pressure 3 lbs. per sq. in. The test quickly reveals any defect, such as leaking, passing gas when the valve is closed, or porosity. Each cock must have smooth, even movement of the plug, and an experienced tester quickly detects the slightest jump or tightening at any position.

The daily run of appliances through the testing rooms consists of those on the approved list, but before an appliance is approved it undergoes most searching tests. Samples are submitted by manufacturers who make certain claims as to efficiency, utility, &c. Many of these claims are fully justified, and the Industry is fortunate in that it does business with manufacturers of appliances whose continual effort is to make improvements on highly scientific lines. Unfortunately another type of supplier enters the market who cares nothing for the well-being of the industry. He is assisted by the tendency to purchase the cheapest article. He spends nothing on research work and assembles the poorest possible appliances, yet his factory is kept busy. He enjoys an unfair advantage unless re-

search work or testing on scientific lines is undertaken by the gas companies.

After approval of a fire for construction utility and ease of maintenance, tests are made of radiant efficiency.

The fire is further subjected to a test of hygienic efficiency without the aid of a chimney pull, the *Lancet* test being employed.

Gas cookers before being accepted must conform to certain standards. The construction of the appliance is examined and particular attention given to the durability of vulnerable parts, also their ease of replacement. It is important never to lose sight of future maintenance.

Boiling burners are tested for efficiency in raising the temperature of a definite quantity of water to boiling point. Modern cooker burners have made a great advance in efficiency and in eliminating old troubles.

The construction and performance of the cooker oven are, of course, matters of great importance. The oven must be capable of heating up in a reasonable time. It must be capable of withstanding an overload of at least 50% above the usual maximum gas consumption without danger of smothering. The heat in the oven should be so distributed as to allow of the largest possible load of food being cooked at one time. The actual overall measurements of an oven are by themselves no criterion, as in many cases much valuable space is lost through clumsy shelf rests and the position of the bottom shelf. The intake of air at the bottom, the area and position of the flue outlet, and the position of the burner or burners are all matters of serious consideration before approval of any design.

Examination of wash-boilers during recent years reveals the production of many attractive and efficient appliances, but, as before mentioned, there is another side to the picture. The boom in house building, where in many cases costs have to be kept at their lowest, has favoured the manufacturer of the shoddy article. Wash boilers have been marketed recently which are unfair to the consumer and harmful to the Gas Industry. Their construction is flimsy and their functioning deplorable.

It is pleasing to note that in the face of this tendency some makers refuse to supply the shoddy inefficient appliance, and that some buyers are prepared to pay a little more for a good article. The condition of affairs only emphasizes the need for a rigid control by the gas undertakings with more discrimination and attention to the testing of appliances.

Before deciding on the acceptance of gas mantles, these are subjected to comparative tests of illumination and durability.

Fittings and appliances after testing and approval are accepted into stores which occupy two flats of the building. The immense variety of articles which must of necessity be stocked demands highly systematized storekeeping. Every possible demand has to be provided for in order to ensure the smooth working of the Department. In accordance with the system, the quantity of any article in stock can be ascertained at any moment, and automatically, those which are reduced to their minimum limit become prominent, thus ensuring replenishment.

Storemen are occupied in preparing and labelling appliances and fittings which have been indented for, and which have to be despatched to consumers' premises prior to the call of the gasfitter at these premises. Every possible means is adopted to simplify this work, such as the provision of catalogues. The catalogues contain illustrations, particularly of fitments which may cause confusion, and in order to obtain the necessary article the gasfitter need only quote the catalogue number in his indent.

Lead and composition tube is rolled into bundles of any particular length by the aid by rollers, which besides producing an easily handled bundle, eliminate kinking and make any measurement by tape unnecessary.

Prepared material is grouped according to its destination in the different districts of the City. It is transferred to the loading bank in these groups and arranged for systematic loading on to the various district vans. Each van run requires the careful planning and routing without which distribution on a large scale cannot be economically accomplished.

Discussion.

The PRESIDENT (Mr. John Greig, Glasgow) said that colour was one of the requirements of the age, and it was becoming increasingly important that fittings should harmonize with the surroundings. Mr. Crossley had said that standardization of appliances was necessary, but he (Mr. Greig) thought that this would be difficult, as changes were always taking place as appliances became obsolete, and unless some sort of finality in design was reached he did not see how complete standardization was possible. He considered that too much standardization was dangerous. He was very interested in the tests which had been described, and since some manufacturers made fanciful claims, it was desirable that their appliances should be tested. Though thermal efficiency of appliances was of great importance he considered that hygienic efficiency was of still greater importance. It was often found that with burners laboratory tests were not confirmed by users, and this might be due to the fact that laboratory tests were concerned chiefly with thermal efficiency, whereas the prime necessity in a burner was that it should be trouble free. He thought that, in view of the fact that some of the appliances marketed were of a "shoddy" nature, it was a pity that the Industry had not yet found it possible to insist on appliances conforming to a definitely standard quality.

Mr. ALEX. BUJNOWSKI thought that it was a pity that such work as they had heard described that day could not be carried further. There were many cases of gas appliances which were exceptionally crude, and these had a very adverse effect on the undertakings. He cited one case of wash boilers which had a high gas consumption and no other means of control than the tap. These were extremely unsatisfactory and the stores department drew up specifications which were adopted by the makers, and the boilers are now giving every satisfaction. Colour to-day was of great importance and people brought pieces of wall paper and curtains and asked for gas appliances to match. He was glad to say that they were able to meet these requirements.

Mr. J. WEBSTER (Port Glasgow) said that he was pleased to have had the opportunity of hearing how operations were conducted on a large scale, as in many of the smaller undertakings such work was done by a man who had many other duties. He asked if, in cleaning appliances by incineration and sand blasting, there was much wastage, and enquired if Mr. Crossley had had any experience of de-greasing by solvents. Colour matching was also being done by the smaller undertakings, and he had found manufacturers very amenable and willing to suit customers' requirements. Testing of appliances was not very feasible for small undertakings, and he suggested that there was scope for a National laboratory with an efficiency mark. If one knew that an appliance had been efficiently tested then one could recommend it much more confidently.

Mr. R. W. COWIE, Jr. (Hawick), said that manufacturers of appliances were now spending a great deal on advertising in the National Press, and he thought that the Industry was losing the advantages of these advertisements if they did not push the sales of these advertised appliances. As regards tests he thought that the Industry had a good friend in *Good Housekeeping*, in which details of tests conducted by an impartial authority were published and could be accepted as reliable.

Mr. W. KIRK (Wishaw) said that he had followed the Paper with great interest and was pleased to note that Mr. Crossley was helping to make kitchens brighter. This was a point on which much greater stress should be placed. He asked if Mr. Crossley could give him a brief outline of how material entering the store was checked and how trace was kept of the smaller fittings.

Mr. CAMPBELL (Helensburgh) said that he endorsed the views of Mr. Cowie as regards the selling of nationally advertised appliances. One could buy appliances from reputable manufacturers and rely on getting articles which would uphold the reputation of the Industry.

Mr. CUBIE (Glasgow) mentioned that some cookers in Glasgow were as good to-day as the day they were installed simply because they were of a standard type and parts were stocked to replace any fitment which became worn.

Mr. FRASER (Dalmarnock) said that what they had heard to-day was really a résumé of a day's work in the stores department. A small undertaking might not be able to undertake this, but he thought that Mr. Crossley, busy as he was, might be able to undertake this work for small undertakings within a radius of 20 miles. He was glad that Mr. Crossley had mentioned the housewife's point of view. In the production of Dalcole his acid test was the "housewife's" test—the burning of the fuel in a fire.

In his reply the AUTHOR said that his Paper had been received in a most helpful manner because most of the remarks which had been made had supplemented what he had said. Anyone in a position to observe the evolution of the gas appliance must be impressed with the future development which industry must make. The President and others had suggested that in adopting standard appliances they were sacrificing something. They were not able to take complete advantage of the developments which were being made. There was a great deal of truth in this, but, on the other hand, costs had to be considered. Standards would not hold for ever, but only for a certain length of time, and then when replacements were made advantage could be taken of recent developments. In reply to Mr. Webster, Mr. Crossley said that he had found de-greasing by solvents to be very satisfactory, but they had not adopted this system because their present plant had been in operation before the introduction of the solvent system. He said that the question of setting up a national laboratory was a difficult one to answer. A national laboratory would probably serve a very good purpose, but every district has different requirements, and a great many people like to see tests carried out. In regard to stocking stores he gave a brief outline of the method used at Milan Street. The material was received from manufacturers along with an advice note; it was checked with this note and entered on to appropriate "in" cards in the stores. The supplier was credited with the full quantity entered on stock card, and the material was passed to test rooms. Any defects were then entered on another column on the stock card,

DEVELOPMENT AND PERFORMANCE OF Thermostatically-Controlled Gravity-Feed Coke Boilers

Below is our report of the discussion on the Paper presented by Dr. F. J. Eaton, of the Gas Light and Coke Company, to the London and Southern District Junior Gas Association at a meeting on March 15, published in last week's "JOURNAL."

The PRESIDENT (Mr. F. C. Smith), in opening the discussion, remarked that he was once more placed under an obligation by his colleagues, who had done so much to make their session interesting. They had listened to a very lucid explanation of modern development in coke boiler design. Starting off with a fuel which by its very nature did not appear to lend itself to precise control, he thought that Dr. Eaton and those associated with him—and there had also been a number of firms who had been actively engaged in this work—had shown them that they had succeeded in controlling in a remarkable manner the output from this type of boiler, while they had also not forgotten that it was necessary to control in addition the comfort conditions of the rooms.

Mr. W. L. BOON (Manager of the London and Counties Coke Association) also congratulated Dr. Eaton on his Paper, and remarked that he was personally particularly interested in the commercial aspect. The year 1931 was a very significant year, he said, for the Gas Industry from the coke point of view—and coke was only second in importance to gas. The heating load was a very important load to the Gas Industry, and it was at that time being lost to oil to such a degree that architects were following fashion and not considering the element of cost. Mr. Boon said that the safety device on these gravity feed boilers should be noted, since where they made use of electricity provision had to be made for its shortcomings. If gas could have been used in the same way they would not have had to consider safety devices.

During the last few years, continued Mr. Boon, they had regained the central heating load for coke. Last year the number of oil-fired central heating plants installed in the London Area fell to six from sixty the previous year. To-day gravity feed coke boilers were firmly established, and he believed they had a tremendous future. Mechanical stokers in conjunction with cheap coal did have some advantages, but if they compared this system with the gravity feed coke boiler it was very evident that one would succeed where the other would fail. Seventy gravity feed coke boiler installations had been effected or were in process of being completed—a remarkable achievement when it was remembered that only three years ago this boiler was still only under consideration. The Gas Light and Coke Company, with the London and Counties Coke Association, had gone ahead and had established this boiler practically themselves, in spite of a certain amount of opposition and prejudice. Now the Gravity Feed System had been established so firmly that they would see a complete recovery of all the business that had been lost.

Referring to Dr. Eaton's statement that, while it was possible by accurate setting of the dampers to get 18% CO_2 in the flue gases before any CO could be detected by means of an Orsat apparatus, it was preferable to work to the figure of 16% to 17%, Mr. Boon enquired what was the Author's reason for going down to this lower figure.

The Manufacturers' Viewpoint.

Mr. CASE referred to Dr. Eaton's remark that now makers had realized there was a market for gas-fired boilers and gas undertakings were in a position to offer attractive block rates there should be a considerable development in gas-fired units. As representing boiler manufacturers, Mr. Case said he did not see why it should be supposed that the manufacturers should spend a lot of money and put units on the market until gas undertakings had found it possible to bring their prices down to a reasonable figure. This Paper was very helpful in showing them the vast importance of coke as a fuel for central heating. Gas undertakings—particularly the Gas Light and Coke Company—had done a great deal during the past few years to bring to the notice of the engineering trade and of architects, as well as the public generally, that coke was the cheapest available fuel for the purpose: and a great deal had been done by way of research work by Dr. Eaton and his colleagues to show that coke need not suffer from the disadvantages of previous years. The advantages that accrued from the several controls which had been explained to them were very obvious. It was marvellous what had been done during the last few years to make the public coke-minded. It seemed that a few years ago, with the introduction of oil for central heating, coke must be for ever a back number. But this had not proved to be the case, because with the introduction of thermostatic control and the gravity feed boiler, coke was able to hold its own now to a much greater extent than a few years ago.

Continuing, Mr. Case remarked that he was conversant with the sectionalized type of boiler shown, and he referred to a test carried out under ordinary working conditions on a boiler of this type, of 1 million B.Th.U. capacity, which was subjected to a continuous test of 54½ hours. The boiler was run at various rates, from 125% for a number of hours, then 70% or 80% of its rated capacity, and later for fifteen hours at as low as 27% of its rated capacity. The whole test showed what could be done on a continuous run, one object in particular being to discover how much clinker would be formed. The amount of coke burned during so long a test would be readily appreciated; nevertheless, the total amount of clinker formed was only 26 lbs. This was due largely, he considered, to the particular advantages of the water cooled grate. The ash was pushed down naturally through the bars into the ash-pit, and, generally speaking, no clinker was allowed to form. Furthermore, the whole of this test was run without any attention to grate except for poking the fire twice.

CO_2 Percentage.

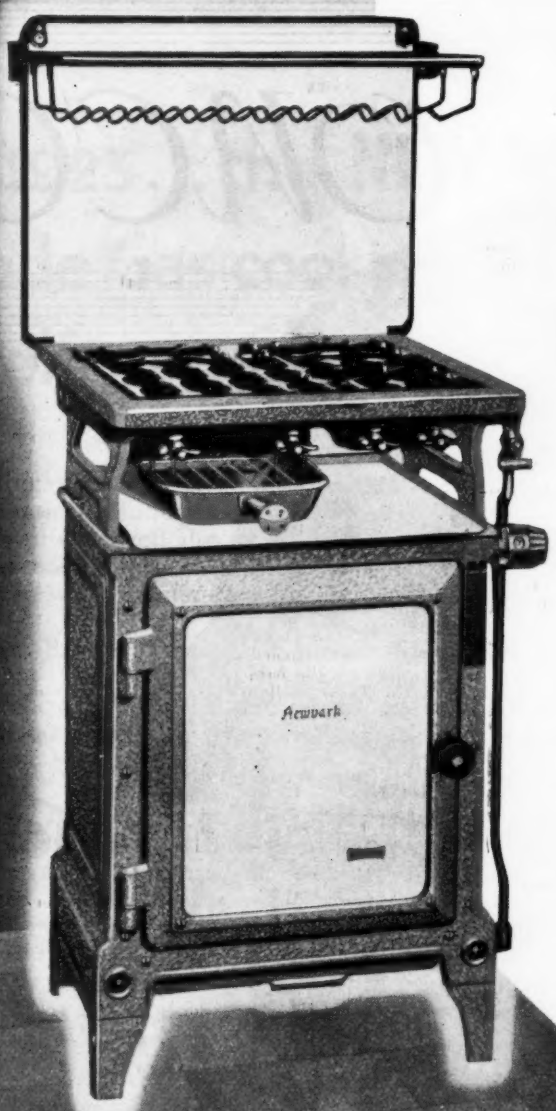
Dr. F. M. H. TAYLOR (Gas Light and Coke Company) said that the boiler makers had done their part in this development work, and, in conjunction with the gas undertakings, had produced useful results. He referred to Mr. Case's testing laboratory at Hull, which, he said, was one of the finest of its kind. In regard to the question of CO_2 percentage, he thought that what Dr. Eaton meant was that a certain proportion of excess air was necessary to burn off the CO to form CO_2. Unless they had 5% or so of excess air they got CO formation, which caused a greater drop in efficiency than would a lower percentage of CO_2. Somewhere about 0·5% of CO meant a loss of efficiency of 3 or 4%, while a drop in CO_2 of 3 or 4% caused a very much smaller drop in efficiency. The question of ash was bound up in the various types of grate. Dr. Eaton was experimenting mainly with grates fitted with rocking bars, and unless one was continually rocking them they did not allow the ash to fall through. The grates thus required attention every three or four hours in order to obtain the full output of the boiler. Most of the grates fitted on outside installations were so designed as to give a maximum amount of air space, and to try so far as practicable to allow as much ash as possible to sift through during the passage of the coke down the grate. This was one of the biggest fields for future development. There were three types of grate, went on Dr. Taylor—the rocking bar, the water cooled, and the plain grate—which were now in use in various hopper-fed installations. One disadvantage of the rocking bar type of grate was the tendency for the cast iron to grow in contact with the carbon and thus cause the rocking bars to stick. The water cooled grate, giving as it did a higher combustion rate, would probably prove to be the winner in the long run.

Dr. Taylor went on to refer to tests which had been carried out at the Imperial College of Science and Technology, where 76·7% efficiency was obtained from the two boilers, while the CO_2 figures were only 10 to 11% at the end and beginning of clinkering periods, from which it would be appreciated that an efficiency of considerably over 80% was easily obtainable with these boilers. He would like to refer to some of the problems associated with the completely automatic operation of boiler plant. In order that the rating of the boiler should not drop unduly through the 24-hour period, it was naturally necessary to set the draught on the boiler considerably higher than one would require at the beginning of a run, in order to counteract

RESOLVE NOW TO ADOPT

The PARKINSON

NEWPARK
GAS COOKERS
THE FINEST PROPOSITION FOR REPLACING BLACK COOKERS



The "Newpark" series of gas cookers has been adopted by many important Gas Undertakings as the ideal all-enamelled cookers for replacing black cookers on Permanent Hire and Hire Purchase terms, in sizes to suit all requirements. The maintenance reports of these undertakings show exceptionally low upkeep costs with a high standard of cooking efficiency. Let 1935 show a reduction in the number of black cookers on your district by adopting the "Newpark" and thus ensure greater consumer satisfaction.

AVAILABLE IN 3 SIZES

THE PARKINSON STOVE COMPANY LTD. STECHFORD, BIRMINGHAM

London Showrooms : Terminal House, Grosvenor Gardens, S.W. 1

At once . . .

Radiation

NEW

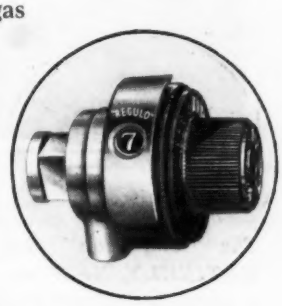
in 1923... the NEW WORLD made Gas cooking simplicity itself.... *Child's play!*

IN recalling that the Regulo-controlled "New World" was the first thermostatically controlled domestic gas oven to be produced in this Country, it is as well also to remember that the principle of oven-heat control was not merely adapted to an existing gas cooker: the "New World" oven was *specially designed* for automatic temperature control.

When the "Regulo" was introduced, doubt was expressed in some quarters that oven-heat control was necessary or desirable. Now, however, following on the success of the "Regulo" the principle of thermostatic control of gas ovens has become adopted generally.

Because the "New World" Cooker is designed for the particular purpose of "Regulo" control, it has extended the whole range of cooking which can be carried out in the oven. With the "New World" a far greater variety of automatic cooking—including over fifty published whole-dinner menus — is possible than with any other gas cooker.

This far-reaching development of the technique of gas cooking is a direct consequence of the introduction, nearly twelve years ago, of the "Regulo"-controlled "New World" Cooker.

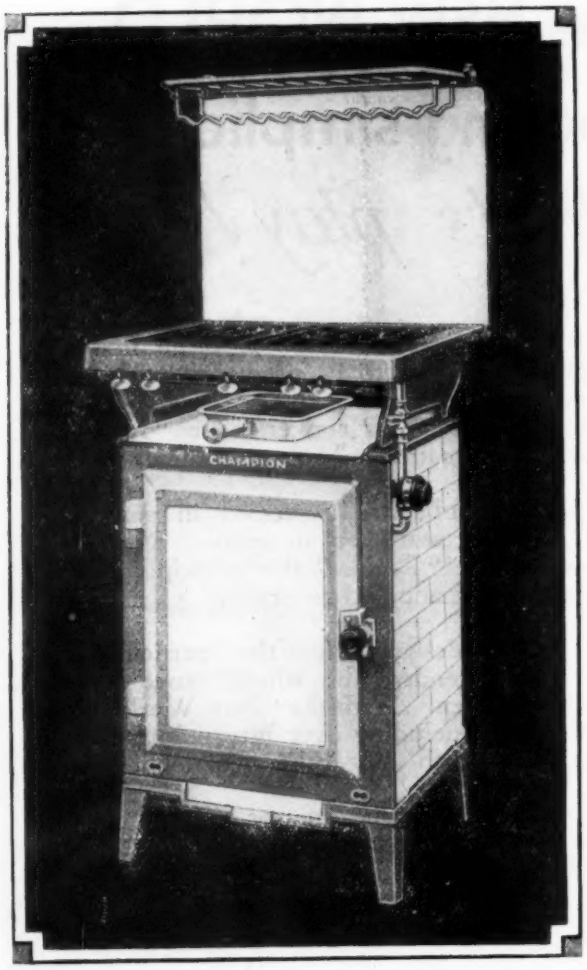


REGULO-CONTROLLED

WORLD

COOKERS & RANGES

The CANNON "Champion"

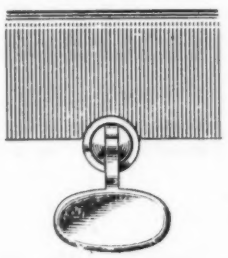


The "Champion" Gas Cooker embodies features ENTIRELY NEW in cooker construction. It has a specially designed bottom-flue oven, ensuring a large region of uniform temperature, with a cooler zone at the base. DOUBLE-INSULATION gives an amazing increase in efficiency and prevents condensate. Gas and Air supply can be regulated from the front. Many other novel features—drop-handle taps, new pattern grill, concealed supply pipes, injectors, etc.—make this new Cannon production the most interesting cooker of the year. Sole Makers: Cannon Iron Foundries, Ltd., Deepfields, Nr. Bilston, Staffs, and Thames House, Westminster, London, S.W.1.

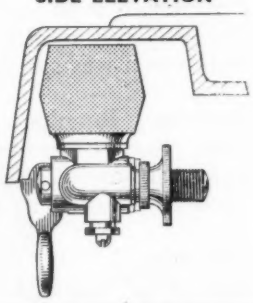
The deep cornice hides the mechanism of the tap barrel and adjustment, facilitates cleaning by covering possible dirt-collecting surfaces, and protects all taps in the "off" position—in transit as well as when installed. It will be seen that the tap lever when hanging down in the "off" position cannot accidentally be turned on, or catch clothing. Taps that are "on" can clearly be seen from a distance and can be regulated with exact adjustment only possible with a symmetrical thumb-piece of this type.

TAP OFF

FRONT VIEW

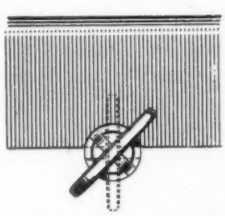


SIDE ELEVATION



TAP ON

FRONT VIEW



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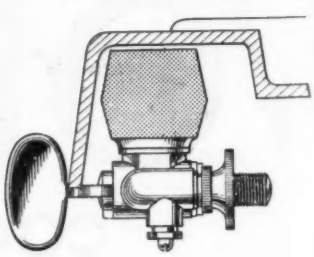

the tendency for ash to build up on the grate, which would hinder the pull on the boiler. By starting off with a higher flue pull, it could so be arranged that the final rating of the boiler at the end of the 24-hour period was maintained. In order to make these boilers and central heating by coke completely automatic, gas undertakings were now offering an "all-in" service scheme, by which not only was the control of the temperature automatic, and the feeding automatic, but the servicing of the installation was also carried out by the gas undertaking. The tenant of the property, therefore, instead of buying fuel, bought heat. In conclusion, Dr. Taylor observed that although big central heating jobs were going to be held mainly by coke, there was an enormous untapped load for gas in the direction of water heating—a load which he hoped would be developed in the future.

Why Not Thermal Storage?

Mr. L. J. FOWLER (Technical Assistant, London and Counties Coke Association) remarked that Dr. Eaton had mentioned that the formation of clinker was inversely proportional to the rate at which the ash was pushed through the firebars. If the load were much less with the boiler running at a higher rate, he suggested that they might introduce a certain amount of thermal storage. Instead of running for twenty minutes at a high load and then for twenty minutes at a low load they might run for a few hours at a high load and then store sufficient heat for the remainder of the day. In conclusion, Mr. Fowler said that he believed that gas and coke were complementary; but before that could be exploited, architects and property owners must be made gas-minded. If one talked to architects about electricity at ½d. per unit they thought it was cheap; but the average architect had very little idea of the price of gas. More propaganda work was necessary, and the best method of approach was through the heating engineer.

Mr. BROOKS (Technical Assistant, London and Counties Coke Association) said that he had watched the progress of the gravity feed boiler step by step because it was he who handled the first order for such a boiler from Dr. Eaton's Company. The gravity feed boiler, continued Mr. Brooks, was now adopted in systems where intermittent heating was required—for example, in cinemas, &c.—but he did not think it would show any saving in fuel, as the gravity feed boiler had to be alight over the week-ends. He suggested the use of two gas pokers, permanently fixed under the firebars of the boiler, for igniting purposes. He believed that a water lute was advocated; and he would like to have Dr. Eaton's remarks in relation to the effect of corrosion on the skirt of this boiler. This, he suggested, might be a serious matter and would necessitate the whole boiler being dismantled.

Boiler Control.

Mr. MOORE (Wandsworth) referred to Dr. Taylor's remarks in regard to increasing the flue draught in order to increase the output of the boiler. From experience he had had with this type of boiler, Mr. Moore said that he had found a considerable increase in the differential on the control. Dr. Eaton had described two methods of control, one of which consisted of a simple unit that could be fixed very easily and on which the setting was not very critical. In the other type of control, the compound bar was not nearly so simple, while it was certainly critical in setting. He inquired which of these two lines Dr. Eaton was developing.

Mr. CASE further remarked that he did not think it was common knowledge that the difference in the efficiency of ordinary types of cast-iron sectionalized boiler, according to whether it was fitted with ordinary fixed firebars or the water cooled type, was between 4% and 5%.

Mr. R. SUMMERSON (Luton) enquired what governed the selection of the key room in the control of thermostatic heating of large buildings.

Mr. J. M. WEBBER (Croydon) asked how the coke was introduced into the hoppers at the top of the boiler owing to their height above floor level. Moreover, the deeper the basement in which the boiler was installed the higher one had to lift the ashes for disposal.

The Author's Reply.

Dr. EATON, in reply to Mr. Boon's question on the CO_2 content of the flue gases, said it was desirable on all fuel burning appliances to have complete combustion even if this was obtained at the expense of the efficiency. Thus, while experiment indicated that a figure of 18% CO_2 could be attained to ensure complete combustion under all conditions and moreover to provide an adequate margin of safety, the CO_2 content should not be increased above a figure of 16% to 17%. Mr. Boon and several other speakers had raised the question of clinker and ash. The experiments carried out at Fulham had included tests on rocking, fixed, and water cooled grates. The fact was that with all types of grate on gravity feed boilers which were only cleaned once in 24 hours there was a gradual accumulation of ash. Only 1% to 2% of the ash fell automatically through fire bars if they were of the type set either at right angles or parallel to the direction of movement of the coke. On such boilers the clinker formation of the maximum combustion rate was 4%. Experiments with a boiler incorporating a special type of water cooled grate had demonstrated that some 40% of the ash fell through the fire bars automatically and the clinker formation at a combustion rate of 4½ lbs./sq. ft./hr. was only 1%. He would like to emphasize that this question of combustion rate was entirely due to the limitations they had put upon themselves in making the boilers operate for 24 hours without attention.

In reply to Mr. Webber, the Author said that only about thirty minutes in 24 hours was required for clinkering and refuelling the magazines from the overhead hoppers. The hoppers were filled by the gas undertaking and could be carried out in a variety of ways; the installations at Horseferry Road, Fulham, Imperial College, and the Architectural Association were examples of four different methods which were satisfactory. It was usual to provide some form of elevator to raise the ash and clinker from the boiler room to ground level.

Mr. Fowler had suggested a coke thermal storage system. Such a system had not been considered, since the formation of clinker can be reduced and the combustion rate considerably increased if a water cooled grate is used.

Mr. Summerson had asked how the key room was selected. It was always difficult to select a room which would sufficiently accurately be representative of the heat loss of the building. It was usual to make sure that the person in charge of the building had the thermostat in his own room! At any rate, it should be placed in a room that had a reasonable amount of ventilation and in which the radiators were correctly proportioned to the heat losses from the room. In blocks of flats it was usually more convenient to install a variostat.

Thermostatic Equipment.

Mr. Moore had raised the very important question of thermostatic equipment. The safety device was designed, in the first place, because they desired to run boiler tests for 24 hours without attention. The device, said Dr. Eaton, worked very well on direct current, though they had experienced a certain amount of trouble on alternating current, and at present various improvements of the electrical side of the device were under consideration. While the device could not yet be considered a thoroughly satisfactory piece of apparatus, it did enable them, with their existing system, to leave the boiler with the knowledge that the dampers would go into the safety position in the event of a current failure. This was of importance since the boiler could be run, without attention, continuously and safely at night as well as by day should this be required. With regard to other types of damper control experiments had been conducted on various mechanisms which incorporated a safety device. The B.T.H. oil thruster was an example of this type; it had given a satisfactory performance in the laboratory, and it will now be used on outside installations.

Finally, Dr. Eaton paid tribute to the valuable co-operation they received from the makers of boiler plant, and emphasized that gas undertakings did not intend to become manufacturers of boilers themselves.

The PRESIDENT remarked that they had listened to a great deal on the subject of thermostatic control, and obviously the point was to maintain comfortable conditions in the room by controlling the air temperature. A more modern way of regarding this matter was to refer to the control of "comfort conditions"—namely, on the basis of equivalent temperature rather than air temperature. For this purpose the "eupatheoscope" had been developed into the "eupatheostat;" and he wondered if Dr. Eaton had considered the possibility of utilizing this rather expensive instrument in the control of coke boilers.

Dr. EATON replied that they did realize that in the control of comfort conditions they must have regard to temperature, humidity, and air movement. No tests had yet been made with a eupatheostat, although there would be no difficulty in linking this up with the damper operating mechanism which had been described. It was generally considered, however, that the three requirements for comfort conditions could best be achieved by air conditioning.

Vote of Thanks.

Mr. WEBBER, in proposing a hearty vote of thanks to Dr. Eaton for his Paper, observed that the Gas Industry had never been ashamed to use electricity in order to produce cheap gas; and it was interesting to see that electricity was being utilized more on the distribution side. He was surprised that no one had raised the point of electrical gear being prone to breakdown. But it was mainly a question of accurate and careful design and first-class workmanship.

Mr. SUMMERSON seconded the vote of thanks, remarking that the Industry would benefit very considerably as a result of the pioneer work of the Gas Light and Coke Company in this direction.

The vote of thanks was heartily accorded, and Dr. EATON briefly acknowledged it.

THE PREPARATION OF Tar for Road Purposes

by J. H. CANNING, Jnr.

On Saturday, March 16, Mr. J. H. Canning, Jnr., of the Newport (Mon.) Gas Company, delivered a Paper before the Wales and Monmouthshire Junior Gas Association on Road Tar, with special reference to Tar-Bitumen Mixtures.

The modern highway must fulfil the following conditions: (*a*) It must be free from dust in the driest weather, (*b*) it must be non-skid, (*c*) it must not "bleed" in hot weather, and (*d*) it must present at all times a good and safe surface for all manner of traffic using the road.

Some curious situations with regard to the adhesive properties of road tar can arise; for instance, if we were to prepare an experimental road surface in the laboratory where the temperature is constant, and apply to it tars of various consistencies at definite intervals throughout its length, our examination would afterwards show that, while the more liquid product had completely adhered, too high a viscosity diminished the adhesive power.

Naturally one would be tempted to assume that the more liquid the product the more suitable it would be for road work, but other factors arise. These thin tars act in similar way to paint—they thoroughly coat the surface they are sprayed on, but they set too quickly, and even though the top dressing be immediately applied, it never binds properly, and as a result traffic picks it up and leaves patches of tar, which in bad weather provide a glassy skiddy surface.

This seems to point to the need of using a higher viscosity tar, but if a very thick fluid is used it adheres to the top dressing and not to the road surface. The ideal appears to be to strike a mean which will as far as possible act as a perfect binder between road and dressing. With this end in view, many experiments have been carried out with the sole purpose of producing the perfect medium, and up to the present experiments have principally been carried out using bitumen products in combination with coal tar, for the express purpose of raising the viscosity to the required level.

The admixture of bitumen provides the retailer with a simple means of producing a mixture of almost any consistency required, simply by varying the percentage of bitumen mixed with the tar.

A simple plant for producing a bitumen and tar mixture suitable for road dressing consists of a tar boiler, bitumen boiler, and a mixing tank with mechanical stirrer. From the mixing tank the mixture is pumped up to storage.

The working of this plant is quite simple if ordinary precautions are taken to safeguard against the main danger, that of fire and degradation of the tar by volatilization, both being the result of the same thing—*i.e.*, overheating. One important point to observe, in regard to the fire question, is always to add the bitumen to the tar, never tar to bitumen, for the bitumen is at a temperature approaching 330° F. and the tar at about 180° F. If the tar reaches the region of 240° F., which is its flash-point, grave risks are run. Always, therefore, run the tar into the mixing tank first—set the stirring apparatus in action and add the bitumen slowly so that it is well admixed and the temperature is kept within limits.

Almost any percentage of bitumen can be added by varying the flow from the boiler—at intervals samples should be taken and any variation in viscosity can be remedied by the plant operator.

Preparation of Road Surface Before Dressing.

A great deal depends on the type of surfacing. Concrete roads are very often treated with tar and chippings, but they require a special form of treatment.

The most usual is a road which has already been treated and is ready to be re-surfaced. It is essential to prepare it so that the new layer will have a fair chance to bind with the old, and for this reason the surface must be clean, dry, and free from dust. All loose topping must be cleared away and the surface well brushed with stiff brooms to remove all dust and small stones from between the existing chippings; it is then ready for the new dressing of tar and chippings.

The heating of the tar or bitumen mixture has many points in its favour. It makes it easier to handle and spread over the surface in the necessary thin film, increases its adhesive power, softens the remains of the previous surface dressing, evaporates any moisture which may be either on the surface, or in the chippings, and generally makes for greater economy in its use. The usual temperature of application—there is no hard-and-fast rule—is between 180° F. and 220° F. It should not be much lower than the stated minimum as it must be really hot, or higher than the maximum for fear of degradation.

It is usually sprayed on the surface, but quite a number of road engineers prefer to brush it on, claiming that they obtain a more even layer and effect greater economy in its use. Directly the dressing is applied to the surface various changes take place.

(*a*) Viscosity rapidly increases as its temperature drops.
(*b*) The adhesive power is increasing at roughly the same rate.
(*c*) The cooler it gets before the chippings are applied the less will be its "wetting" effect on them, and this combined with the lack of adhesive power will not give them a chance to bed properly.

The above-mentioned points show the necessity of applying the chippings, so far as it is possible, immediately the dressing is laid.

Chipping forms the carpet or "wearing layer," and is formed of a variety of substances, such as granite, limestone (this is not very satisfactory because of its tendency to scale, low mechanical strength, and dust-forming tendencies), greenstone, and slag (used in districts where it is plentiful, but is not to be recommended as it sometimes contains fragments of metal, also it is porous and of low mechanical strength). Flint and gravel should never be used, for the smooth and rounded surface gives the tar no chance of properly adhering to it, and so it will not bind tightly.

Whichever type of chipping is used, it should be clean, dry—a film of moisture will prevent adhesion of tar—carefully graded to a suitable size and free from fines and dust. As soon as the tar has been applied to the surface, where it forms a layer a mere $\frac{1}{16}$ in. in thickness it should be "blinded" with chippings so that they form a layer roughly one stone in thickness.

A heavy, usually 10 tons, roller follows up the work and presses the chippings into the tar, causing them to become coated and firmly bedded. Too heavy a roller or too prolonged rolling is to be avoided, for this has the effect of making the coating "well up" to the surface of the dressing and so destroy its non-skid surface. If this work is carried out conscientiously, traffic running over it immediately it is completed will have no adverse effect—in fact, it will further aid in consolidating the surface.

It is rather a confession of failure to have to apply a dressing to a concrete highway, the original construction of which provided for the actual concrete surface to be the "wearing layer." In many areas, however, it has been observed that after about five to seven years' use these roads have worn considerably under the pounding effect of heavy traffic, and road authorities have seen fit to apply a surface coat to them. The surfaces have been treated in many cases and with excellent results by applying the hot dressing direct to the concrete and chipping with $\frac{3}{8}$ in.-$\frac{3}{4}$ in. aggregate. A light roller is used and the treated portion fenced off. The composition of the hot dressing for this process is approximately:

Bitumen	87–95%
Tar	5–13 ,,

Discussion.

The PRESIDENT (Mr. A. D. Howells, Neath) congratulated Mr. Canning on his Paper. Modern roads had to stand a great deal more wear and tear than formerly. The author had shown them how tar could be prepared at their works and used to great advantage on the roads, and had pointed out how it could be treated with bitumen to bring it up to comply with the British Standard Specification. They should point out to road engineers that the Gas Industry could produce a tar suitable for

their requirements. He would like to know if Mr. Canning had carried out any experiments using pitch instead of bitumen.

Mr. C. B. FELTON (Newport) said that he was very interested in the surfacing of roads, as it affected the manufacturing side of their business, and if gas engineers were to take the matter up more seriously with road surveyors and borough engineers they would finally obtain a surface that would lead to a reduction in the number of road accidents. The complaint of the road engineer was that the surface did not last long enough. If more tar and better chippings were used they would find that it would last longer.

Mr. A. E. PASK (Caldicot) also wished to congratulate Mr. Canning on his Paper and the interesting manner in which he had introduced the subject.

Mr. J. F. RUST (Newport) stated that the majority of representatives on the councils in South Wales were connected with the mining interests, and yet they were the hardest people in the world to convince that by using more tar they would be doing a good turn for those they represented.

Mr. H. S. BARTLETT (Cardiff) reminded the Association of the circumstances under which the Paper had been written. Mr. Canning was to have delivered a joint Paper with Mr. John Wilson, who had recently left Newport for Keighley, on two aspects of complete gasification. Mr. Wilson was unable to be present at the meeting, and so, at short notice, Mr. Canning had prepared another Paper. He recalled the pleasure of seeing a film on the subject at the British Industries Fair, but he would like to see that film shown all over the country, seeing that there was so much to be done.

Mr. I. G. JENKINS said the subject of the Paper was very opportune, since they were on the brink of the tarring season, and was deserving of as much publicity as they could obtain for it. They must convince the borough surveyors and committees of the various councils up and down the country of the advantages of tar.

In his reply Mr. J. HERBERT CANNING, Jnr., said that the President's query really boiled down to the old question of horizontal *versus* vertical tar. Horizontal tar invariably had a much better viscosity curve than vertical tar and set more rapidly. Both tars were quite satisfactory in use, but in many cases the distillers combined the two tars together on preparation. He had had no experience with the use of pitch instead of bitumen.

[Following the Discussion on Mr. Canning's Paper, the meeting was thrown open for a general discussion on "Gas Problems," and members were invited to put their own particular problems before the meeting. Among those who availed themselves of this opportunity were: Messrs. A. D. Howells, J. F. Rust, A. E. Pask, W. A. Pask, R. T. Mills, J. H. Canning, F. Robertson, W. Beech, and J. H. Canning, Jnr. It was decided that in future queries should be sent to the Hon. Secretary in time to be circulated with his notice, and so enable members to collect information on the subject.]

The Midlands Gas Industry

A Dinner and Dance

A large company from all parts of the Midlands attended the Gas Industry Dinner and Dance held at Tony's Ballroom, Birmingham, on Monday, March 18. The chair was occupied by Alderman R. H. Hume (Chairman of the Birmingham Gas Committee), and those present included Mr. C. Valon Bennett (President of the Institution of Gas Engineers), Mr. Arthur Roberts (President of the Midland Association of Gas Engineers and Managers), and Mr. Douglas W. Turner (Chairman of the Society of British Gas Industries).

Mr. C. Valon Bennett, proposing the toast of the Midland Gas Industry, said that those present were taking the first step in the Provinces (and other districts might well follow their example) to cement the bonds created by the formation of the British Gas Federation, which came into being in November last. The Federation in no way affected the constitution of any of its Member Bodies; but co-operation between all the interests of the Gas Industry was essential, and it was with that idea in view that the Federation was formed. He remembered a phrase "United we stand, divided we fall," but he could safely say that there was not the slightest risk of the Gas Industry falling, for it was not founded upon the sand, or upon the promises of politicians, but upon a rock. It was true they had to fight for their business, but there was to be no stepping back.

It was fitting that the first move in the Provinces regarding districting of the British Gas Federation should take place in the Midlands, because it was in Birmingham that gas was first used for practical purposes in a factory. Ever since that time the Midland Gas Industry had pulled its weight. The people of the Empire were the most level-headed in the world; they knew a good thing when they found it, and they stuck to it. They appreciated that gas was the best medium where any form of heat was required, and that in many other spheres it was supreme. There were, however, many uses for gas with which the man-in-the-street was not so fully acquainted as they would like, and it was the Gas Industry's job to make those uses better known. "Mark you," said Mr. Bennett, "we have no State subsidies to aid us; we must depend upon our own efforts."

A trade depression had been hanging over the whole world but he was glad to say that was passing away in England. It was a slow process but a steady one, and he was proud to think of what the Gas Industry had done in that recovery. Provided the scales were not too heavily weighted against them the Industry would march still further forward in helping to remove that depression. Gas was not only the best servant in the home, but he believed it would be the salvation of industry in this country.

After a reference to slum clearance, Mr. Bennett mentioned that gas was to be used very extensively in the building that was to be presented to His Majesty by the Royal Warrant holders. The cooking apparatus to be used in that residence was to be manufactured in Birmingham, and he believed by a gas appliance firm whose able representative, Mr. Rogers, was with them that evening. Nothing but the best was good enough for the King, and the medium that was employed for cooking, heating, and water heating in the residences of His Majesty was available for the most humble of his subjects.

He could not let that opportunity pass without congratulating the Birmingham Gas Department, which was so ably presided over by their Chairman, with Mr. A. W. Smith as General Manager and Mr. Tomlinson as Chief Engineer, on the wonderful street lighting to be seen in Corporation Street and New Street. If anyone wanted confirmation of the fact that gas was not dead for lighting purposes let him go and look at those examples. "I say," concluded Mr. Bennett, "with much knowledge and a great deal of enthusiasm that, glorious as the past of the Gas Industry has been, it has a still more wonderful future in front of it."

Mr. Douglas W. Turner, in responding, said the occasion was unique in that it was the first time the contracting side of the Industry had been invited to join them at such a gathering. He thought it was very appropriate that the Midlands should have done that because he had been looking through the list of firms that comprised the Society of British Gas Industries, and he was pleased to find that 50% were from the Midlands. If he might be candid he would say that up to now the work of the S.B.G.I. had not always been fully appreciated; there had been a tendency for it to occupy rather a secondary position in the Industry. For that reason the gathering was unique. His hearers would agree that the prosperity of the Gas Industry was dependent upon the prosperity of British industry as a whole, and the prosperity of the Midland Gas Industry was dependent upon the prosperity of the Midlands. In the Midlands they were proud of their industries and of their varied and numerous character. But many were faced with the problem facing most of the industries of the country at the present time, especially the older industries, and that was a capacity to produce which was greater than the capacity of the world to buy. At present in the Midlands some very drastic schemes of re-organization were taking place, but the district was fortunate in that new industries were constantly being established. They were also fortunate in that they had a labour force particularly versatile in adapting itself to those industries. Thus they got their full share of the new industries that were being established. The Midland Gas Industry, so far as it was dependent upon Midland industries, was in a healthy condition.

They had now got co-operation among all sections of the Gas Industry by the formation of the British Gas Federation. For the first time the Industry was able to speak with one voice on national problems, and he was sure that this was a great advance.

The toast of the Chairman was heartily drunk and the company adjourned for dancing and a cabaret. There was a very large attendance at the function, and all were grateful to Mr. S. J. Sadler and Mr. R. J. Rogers (Joint Secretaries) and the Committee responsible for the excellence of the arrangements.

Gas Undertakings' Results for 1934

Dover (S.E. Gas Corporation).

The audited statement of accounts of the Dover Gas Company for the year ended Dec. 31, 1934, shows that after paying in respect of the first half-year a dividend of £3 15s.% on the ordinary stock and shares, and after writing off past Parliamentary and capital issues expenses, providing for all fixed charges, and contributions to special purposes, renewals, and Co-partnership funds, there is a total available balance of £17,149, out of which the Directors recommend the payment, less income-tax, of a dividend in respect of the second half-year—viz., at the rate of £4 15s.% on the ordinary stock and shares, making, with the interim dividend, 8¼% for the year, which will absorb the sum of £5,819, leaving £11,330 to be carried forward to the credit of the current year. The sales of gas show an increase of 69,634 therms, equal to 4¼% over the previous year. The number of consumers has increased by 271.

Dublin.

The report of the Directors of the Alliance and Dublin Consumers' Gas Company and statement of accounts for the half-year ended Dec. 31, 1934, state that the accounts show a profit on the revenue account of £71,561, and, after providing for interest on debenture stock, interest on temporary loans and income-tax, there remains the sum of £59,279, to which must be added the sum of £27,765, being the balance brought from the last account, making a total of £87,044. The Directors recommend the declaration of a dividend at the rate of £7% per annum, less income-tax, on the consolidated ordinary stock of the Company. This will absorb the sum of £54,315, after which a balance of £32,729 will remain to be carried to the next account. The Directors regret having to record the death since the last half-yearly meeting, of their esteemed colleague, Mr. John E. Kidd. The vacancy has been filled by the co-option of Mr. Francis W. Swaine Cope. Three of the Directors, Mr. Francis Calvert Butler, Mr. John McCann, and Sir Richard A. Needham, will retire by rotation, and, being eligible, offer themselves for re-election. Mr. William Cash, Junr., F.C.A., one of the stockholders' auditors, will go out of office by rotation, and being eligible, offers himself for re-election. Owing to the continued expansion of the Company's business for many years past, the capital of the Company has been largely overspent and there is in consequence a heavy overdraft on the bank account. The Directors deem it prudent to pay off the overdraft and to provide for anticipated further expansion. Under Section 17 of the Company's Act of 1909 the Company is authorized to raise additional capital not exceeding in the whole the sum of £300,000 by the creation and issue of consolidated ordinary stock. An extraordinary meeting has therefore been called for the purpose of creating and issuing such nominal amount of capital as shall be sufficient to produce including any premium which may be obtained on the sale the sum of £300,000. The consolidated ordinary stock to be so created and issued will rank *pari passu* with the existing consolidated ordinary stock.

Horsham.

The report of the Directors of the Horsham Gas Company, Ltd., for the year ended Dec. 31, 1934, states that despite the mild weather during December the sale of gas shows an increase of 3·68% for the year. The demand for additional appliances has also been most satisfactory. In April last, a further reduction of 1d. per therm was made in the price of gas, and a scale of charges was adopted giving additional concessions for large consumption and power purposes. An issue of £5,000 4% irredeemable debenture stock was made in June at £102%. The Directors recommend a final dividend of 2¼% on the preference, 5% on the original, and 3½% on the additional shares, less income-tax, making with the interim dividend 4½%, 10%, and 7% respectively for the year. This will absorb the sum of £1,430, leaving a balance of £3,796 to be carried forward.

Londonderry.

The Directors' report and statement of accounts of the Londonderry Gaslight Company for the year ended Dec. 31, 1934, states that the undivided balance brought forward from the previous year, after payment of dividend, amounts to £13,905, to which is added the year's profit, as shown by revenue account, £3,564, making a total of £17,470. Out of this sum there has been paid a year's interest, less income-tax, on the loan capital, £161, leaving a balance of £17,309. The Directors propose to pay a dividend for the year to Dec. 31, 1934, at the rate of 10% on the old shares, and at the rate of 7% on the new shares, less income-tax, which will absorb the sum of £3,495, and carry forward to the next account £13,813. It is pleasing to note the demand for gas is still increasing. A sum of £2,800 has been charged in the revenue account for the purpose of meeting future cost of renewals. The actual expenditure of £2,605 incurred during the year has been charged against the suspense account.

Maryborough (Queensland).

The half-yearly report of the Directors of the Maryborough (Queensland) Gas and Coke Company, Ltd., to Dec. 31, 1934, states that gas sales show a slight increase as compared with the corresponding period of 1933, but residuals show a decrease, the latter being accounted for by less tar sales. The expenditure is slightly less than the corresponding period of 1933. After writing off £500 for depreciation, and making provision for all other charges, the profits amount to £1,204. To this amount has to be added £128, brought forward from last half-year, making the total amount at credit of profit and loss account £1,332. The Directors recommend payment of a dividend of 5% per annum, amounting to £1,031, leaving a balance to be carried forward to provide for taxation of £301.

Minehead.

The balance of net profit, as stated in the Directors' report of the Minehead Gas-Light and Coke Company for the year ended Dec. 31, 1934, is £4,532, which, added to the amount brought forward from the last account, £1,240, makes a total of £5,772. After deducting income-tax, £877, and mortgage interest, £301, and debenture interest of £165, and carrying £250 to leasehold depreciation fund account, there remains a balance available for distribution of £4,180. The Directors recommend a dividend of 8%, less income-tax, on both the £5 and £1 shares, which absorbs £2,914, leaving a balance to carry forward of £1,266. The year was featured by a remarkably fine and hot summer, and a very mild November and December. Up to the beginning of November the gas sales showed a satisfactory increase above 1933, but the last two months' abnormally mild weather turned an increase into a slight decrease. The sale of gas was 56,260,700 c.ft., a decrease of 2·4%. During the year a special sales campaign of cookers was undertaken, whereby 242 were sold, replacing over 200 old cookers. The net gain in consumers for 1934 was 85, while gains in apparatus were 75 cookers, 32 water heaters, 50 wash-coppers, 67 gas fires, 8 radiators, and 64 minor apparatus. Over 200 lighting points have been fixed, including 69 switch controlled. During the year approximately 700 yards of 2-in. cast iron mains has been replaced with 4-in. steel main in various districts.

Narborough.

The report of the Directors of the Narborough, Blaby, Enderby, and Whetstone Gas-Light and Coke Company, Ltd., for the year ended Dec. 31, 1934, states that the manufacture and distribution of gas has continued in a satisfactory manner, and despite the mild weather experienced towards the end of the period under review, sales of gas show an increase over the previous year. The increased gas storage capacity, and coke cutting and grading plant, mentioned in the last report, have now been completed. Various extensions to the district mains have taken place, and a further 150 additional consumers connected up. It will be necessary during the current year for the Company to apply for Statutory Powers. It is recommended that a final dividend be paid on the ordinary capital of the Company, of 2s. 6d. per share, less tax, making, with the interim already paid, 7½% per annum, transfer the sum of £307 to the credit of the renewals fund, and create a new reserve fund with the sum of £500, leaving to be carried forward the sum of £1,584.

Rochester (S.E. Gas Corporation).

The accounts of the Rochester, Chatham, and Gillingham Gas Company for the year ended Dec. 31, 1934, show that after paying in respect of the first half-year dividends at the rate of: £6 10s.% per annum, less income-tax, on the consolidated ordinary stock, £5 10s.% per annum, less income-tax, on the irredeemable preference stock, and after paying the second half-year's dividend on irredeemable preference stock, there is a total available balance of £24,147, out of which the Directors recommend the payment of the following dividend in respect of the second half-year—viz.: On the consolidated ordinary stock at the rate of £6 10s.% per annum, less income-tax, which will absorb the sum of £10,759, leaving £13,388 to be carried forward to the credit of the current year. The gas made during the year amounted to over 1,065 million c.ft., or 5,060,422 therms. During the year the Company's mains were extended so as to provide a supply of gas at Shorne.

Rugby.

An increase of 6·7% in sales of gas was reported at the annual meeting of the shareholders of Rugby Gas Company. The Directors' report stated that demand for all types of gas-consuming apparatus was being maintained, and that further extensions of mains had been made in the suburbs of the town. The balance on the profit and loss account was £12,814, and dividends for the half-year, to Dec. 31 last, at the rate of 7% per annum on the sliding-scale stock and 5% per annum on the maximum dividend stock were recommended.

Seaham Harbour.

At the annual meeting of the Seaham Harbour Gas Company, Mr. Malcolm Dillon, the Chairman, expressed satisfaction with the results of the past year, which showed a credit balance of £3,362, which was £487 more than the previous year. To the profit for 1934 was added £1,334 brought forward from the previous year, making a total of £4,696, out of which £1,000 had

been transferred to plant renewals account and £1,779 carried forward. Clearance schemes under the Housing Act of 1930 had affected the Company's business, but arrangements were well forward for providing a supply of gas to the new houses, and it was expected a considerable amount of business would be recovered. Dividends equal to 4½% on the preference stock, 6% on the "A" and "B" stock, and 4½% on the "C" stock were approved.

Swindon.

The Directors' report and statement of accounts of the Swindon United Gas Company state that the usual dividend of 5½% is recommended. During the past year the price of gas had been reduced by 4%, or ½d. per therm. This brings the total reductions in three years to 14%, representing a saving of nearly £16,000 per annum—an average of 18s. per consumer per annum. A record amount of gas has been sold, and new appliances have exceeded all previous figures. Over 570 new customers were connected during the year, bringing the total up to 18,455. During 1934 the Company had acquired control of three gas companies—viz., Wootton Bassett, Highworth, and Faringdon.

Uxbridge.

The report of the Directors of the Uxbridge, Maidenhead, Wycombe, and District Gas Company shows that there was a profit on the revenue account for the year of £43,223, which, added to the balance of £10,650 brought forward from last year and bank interest, £275, gives a total of £54,148. There has been a steady rate of progress in all departments resulting in record achievements in every direction. The quantity of gas sold, 992¾ million c.ft., which constitutes a record, showed an increase of 2·6%; this follows an increase of 3·3% for 1933. Had it not been for the abnormally mild weather the gas sales would undoubtedly have been more. The Company sold between four and five thousand cookers, fires, and water heaters in 1934, and the number of meters fixed now totals no less than 45,000. 24 miles of new mains were laid during the year, making the present total 408 miles.

Wellington (Salop).

The Directors' report of the Wellington (Salop) Gas Company shows that a profit of £7,562 was made on the year's working, and the Directors recommend the payment of a dividend of 3% on the redeemable preference stock for the half-year ended Dec. 31, 1934, making, with the interim dividend already paid, 6% for the year, less tax, and on the ordinary stock 3½% for the same period, making, with the interim dividend already paid, 7% for the year, both less income-tax. An increase in the expenditure of £1,029 over last year was offset by an increase in the gas rental of £1,143, and an increase from coke sales of £297. There was an increase of £1,143 in gas sales, which is regarded as a very satisfactory figure. The net result of the year's trading was a profit balance of £7,562, against £7,152. The sales of gas amounted to 175¾ million c.ft., or 5·3% more than in 1933.

Whitby.

The Directors of the Whitby Gas Company in their report for the year ended Dec. 31, 1934, state that the profit and loss (or net revenue) account, after charging the same with interest on debenture stock, preference stock, banking account, deposits, and mortgages, and after providing for the interim dividend paid to June 30 last, shows a balance of £2,400, out of which the Directors recommend the payment of dividends at the rate of £8 10s.%, less income-tax, on the original capital, and of £2 9s.%, less income-tax, on the additional and new additional capital, for the half-year ended Dec. 31, making with the interim dividends paid for the half-year ended June 30, 1934, £6 10s.% on the original capital, and £4 11s.% on the additional and the new additional capital for the year. This will absorb £1,071, leaving a balance of £1,329 to be carried forward. During the year, 146 new consumers have been connected up. The output of gas shows an increase on the previous year. New mains have been laid and old mains re-laid in various parts of the town to meet the increased demand for gas.

Woking.

The quantity of gas sold by the Woking District Gas Company in comparison with 1933, as stated by the Directors' report and statement of accounts, shows an increase of 7,995,696 c.ft., or 3·92%. Receipts from the sale of residual products also show an increase of £216. The net gains in consumers during the year number 280, and 1,187 cookers, gas fires, &c., have been fitted. The profit on revenue account, including interest receivable, is £14,219, and after charging interest on debentures, loans, &c., and income-tax, amounting in total to £6,463, there remains a balance of £7,757, which represents the net profit for the year, to which must be added £5,866, the balance brought forward from last account. The interim dividends absorbed £3,853, leaving a disposable balance of £9,770, as shown in the profit and loss account. The Directors recommend that final dividends for the year ended Dec. 31, 1934, be paid at the following rates (less income-tax): On the "A" ordinary stock £5 10s.%, making £11% for the year; on the "B" ordinary stock £3 17s.%, totalling £7 14s.%; on the "C" preference £2 10s.%, totalling £5%; on the 8% redeemable preference stock £4%, totalling £8%. These appropriations will amount to £3,853, leaving a balance of £5,918 to be carried forward to next account.

The European Gas Company, Ltd.

The Annual General Meeting of the European Gas Company Ltd., was held in the Essex Room, Great Eastern Hotel, Bishopsgate, London, E.C. 2., on Tuesday, March 19, 1935. Mr. FRANK H. JONES, M.Inst.C.E. (Chairman), presided.

The SECRETARY (Mr. T. H. Martin) read the notice convening the meeting, and the Auditors' certificate on the balance-sheet.

The Directors' Report and the Accounts for the year 1934 were taken as read.

The CHAIRMAN, proposing their adoption, said:

The Times Annual Financial and Commercial Review of the year 1934 contains some observations with regard to the situation in France which are, I think, worth quoting. They are as follows:

> "Throughout 1934 the crisis continued to affect every department of French economic life. Signs of recovery which had become faintly noticeable in Great Britain and other countries did not extend to France. . . .
>
> "Commercial activity, which had fallen to a very low ebb at the beginning of the year, never really recovered. . . . There was a marked deterioration of business, and American monetary developments exercised an adverse influence. . . . During May affairs showed signs of rising from the prevalent stagnation. But there was no real improvement. The small spurt faded out and a period of disappointment followed during the summer months, marked by an increase in commercial failures, falling prices, decreasing production and decline in the value of securities. This continued to the end of the year, when a stage of low equilibrium was reached, leading to the hope that France had at last touched the bottom of the depression. . . .
>
> "Employment remained at a very low level throughout the year. . . ."

It was in these conditions that business had to be carried on during the past year, and the Directors are happy to be able to report that the decrease in gas consumption is no more than 1·43% as compared with the year 1933, which, I may remind you, was a record year for the sale of gas in the history of the Company.

This result was due rather to the efforts of our Commercial Departments and to the development of our propaganda work than to any improvement in the general industrial situation.

You will have noticed that there is again an increase in the number of consumers, and perhaps the most satisfactory feature is that the improvement in the sales of apparatus at our showrooms, which I mentioned last year, shows no sign of slackening.

1933 showed an increase of 36% over the 1932 sales of apparatus, and 1934 shows a further increase of 21·3% on the 1933 figures; the turnover has increased from under two millions of francs in 1932 to nearly 3½ millions in 1934, an increase in the two years of very nearly 75%—and this during a period of political crisis and industrial depression!

It does not seem unreasonable, therefore, to hope that as soon as there is any improvement in financial and trade conditions in France, the apparatus which has been purchased and installed by our consumers will lead to an increase in the consumption of gas. At the present moment, however, there is very definite evidence of reduced consumption for industrial purposes and of the deliberate restriction of consumption by private individuals for reasons of economy.

Our own efforts are being supplemented by an energetic campaign undertaken by the Gas Industry as a whole to popularize the use of gas in France. This campaign is beginning to have its effect, and it is a most valuable auxiliary to the Commercial and Propaganda Departments of the individual undertakings.

No mention is made in the Report this year of the question of unaccounted-for gas. The year 1933 showed the first real results of the efforts made to cope with this problem, and while the 1934 figure shows little further improvement, it at least indicates that the progress made has been maintained.

As a result of concentrated efforts and closer supervision of the workings, economies have been effected in many directions, while substantial advantage has been gained by centralizing the buying of a large portion of the stores required.

As a result, the profits enable the Board to recommend a dividend at the same rate as last year, and to carry forward rather more than usual. This result has been obtained after making full provision, to the satisfaction of the Company's Auditors, for all liabilities accruing to Dec. 31, 1934.

As I have already stated, it is the Board's intention, as soon

as conditions are more stable, to equalize the interim and final dividends; the time is still not ripe for this.

Perhaps the most important event which occurred in the year 1934 was the completion and putting into action of the Company's new works at Roche Maurice, Nantes. Gas was first made there in the month of June, and by August the whole of the town of Nantes and its surrounding communes was being supplied from the new works, the old works at the Quai des Tanneurs being gradually put out of action. The old works was kept ready during the transition period in case of any emergency, but the new works was brought into use without any serious hitch, and no recourse had to be made to the old gas-making plant, which was finally shut down in the autumn.

The Board are more than satisfied with the results being obtained at the new works, which are of the most modern design; and the stockholders have in them a gasworks of which any company might be proud.

I would remind you that these works were designed and erected and put into action under the supervision of the Company's own staff, without recourse to any outside technical assistance. The Board have already expressed to the officers concerned their appreciation of the satisfactory conclusion of their labours.

The works at Roche Maurice only represent to a small extent an increase of capacity, and being for the greater part a mere replacement of old works, the cost has been borne in the main by revenue. The necessary funds have been provided by temporary overdrafts from the Company's bankers, and it is satisfactory to have been able to complete the works without having to carry in the accounts any suspense items in this respect.

Considerable expenditure will have to be met in the current year for the completion of the contracts in connection with the construction of Roche Maurice, but after this year the Company should be free from the heavy financial burden which this work has entailed.

In this connection the Board have thought it wise, since the close of the year, to take advantage of the very high prices ruling for gilt-edged securities to dispose of certain of the Company's investments which would have been repaid at no far distant date at prices substantially below current quotations. A considerable profit on the book value of those investments has been realized, and the Bank Loan has been paid off to the amount of the securities sold, namely, £84,000.

The shutting down of the old works at the Quai des Tanneurs leaves us with a valuable site in the centre of the town of Nantes, the utilization and disposal of which is at the present moment under consideration. It is hoped to be able to concentrate all the Administrative and Commercial services at the Company's gasholder station in Nantes, and to dispose of the whole of the old works site for building purposes.

This, however, may take some little time, especially as conditions are hardly favourable at the moment for the sale of a considerable area of land.

I have from time to time referred to the Board's policy of providing better showroom accommodation, and considerable progress was made in this direction during the past year.

At Caen the showroom was completely modernized and certain improvements were carried out at Rouen; at Havre the construction of a building for showroom and offices with provision for all the ancillary services was commenced, and it is hoped that the new premises will be opened during the present summer.

At Nantes, where the showroom premises were in a good position, but inadequate in size, the opportunity was taken to acquire the lease of an adjacent shop, and the whole premises are now in course of being completely re-modelled.

For some time there has been a difference of opinion between the Municipality of Caen and ourselves with regard to the interpretation of certain clauses in our contract, and during the year 1934 we entered into negotiations with the Municipal Authorities, with a view to getting rid of this source of trouble, which had led to litigation. I am happy to say that these negotiations were completely successful; a compromise was agreed to, the lawsuits withdrawn, and the Company's concession prolonged by 30 years from 1956 to 1986.

The accounts themselves do not appear to call for very much comment. The temporary loan from our Bankers is, of course, up owing to the expenditure on the works at Roche Maurice, but this, as I have already mentioned, has been reduced since the close of the year by the sale of securities.

Most of the items in the Revenue Account show an increase as compared with 1933, almost entirely due to the conversion of francs to sterling at a lower rate of exchange, which has, incidentally, been to the advantage of the Company in the conversion of profits.

There is a very considerable increase in the item "Management and General Expenses, London and France," but the increase is more apparent than real. It is due to a more accurate system of accounting in France, by which management expenses, which had hitherto been charged to certain working accounts, and which were, therefore, included in the past under the headings, "Manufacture of Gas" and "Distribution of Gas" are now properly grouped under the heading "Management."

The Renewals and Contingencies Fund has been severely depleted by the Roche Maurice expenditure, and it has been necessary to make abnormal allocations to it in recent years to meet the charges which it has been called upon to bear. It is hoped that, with a relief from those abnormal charges, it will be possible to build up this fund to a figure which will enable it to serve adequately for the purpose for which it was intended—namely, to meet unforeseen contingencies and to bear the cost of work of reconstruction and repair which is not of a regularly recurring nature and which is not properly chargeable against the revenue of the year.

The year 1935 is our centenary year. The Company was founded in 1835, and at three of the towns where we have concessions—namely, Boulogne, Havre, and Amiens—we have supplied gas for a century; the other towns were added subsequently and their individual centenaries will occur at short intervals from 1936 onward.

It is the custom in France to celebrate an occasion of this nature, and provision has been made in the 1934 accounts for the expenditure which it may be necessary to incur in this connection.

It may be of interest on this occasion to recall that the European Gas Company was founded in 1835 to absorb a Company formed in 1833 under the title of the French National Gas Company, and that its original capital was £200,000. After many vicissitudes in its early years, it reached a state of considerable prosperity in the period before 1914. The war years brought many difficulties and complications, and there was a period of even greater difficulty after 1918, when, owing to the collapse of exchanges, it became necessary to revise the whole of the Company's concessions in order to bring them into harmony with post-war conditions. Once this task had been accomplished we were able to devote our energies to the consolidation and development of the Company's business, and given confidence and stability on the Continent, the Directors regard the close of the first century of the Company's existence and its entry upon its second century of life with every confidence and every hope of a period of steady expansion and continuing prosperity.

I now propose:

> "That the Report of the Directors and the Statement of Accounts for the year ended Dec. 31 last be received and adopted."

Mr. A. M. PADDON, M.Inst.C.E. (Deputy-Chairman), seconded the resolution.

Mr. BISGOOD (a stockholder), having congratulated the Board, on behalf of a very considerable number of stockholders who were not able to be present, on the conduct of the Company's business during a very difficult year, said he was glad the Board had sold some of their gilt-edged securities against the loan. Indeed, he hoped they would sell all the gilt-edged securities so far as was necessary to pay off the loan, because, although money was easy to get, the banks were liable to call in a loan, and in days of crisis it would not be easy to sell securities.

He also referred to the point which he had raised on previous occasions—namely, the possibility of disposing of the undertaking, on the ground that it was not satisfactory to have a security entirely at the mercy of a foreign country.

After the CHAIRMAN had replied, the Resolution for the adoption of the Report and Accounts was carried.

Declaration of Dividend.

The CHAIRMAN proposed:

> "That the interim dividend of 2½% paid on Oct. 1 last be hereby confirmed. That a final dividend for the year ended Dec. 31 last at the rate of 3½% be now declared, such final dividend to be paid on April 1 next, the whole out of interest and profits and free of Income-Tax."

Mr. A. M. PADDON (Deputy-Chairman) seconded, and the resolution was carried.

Re-Election of Directors.

The re-election of the retiring Directors—Mr. F. H. Jones, M.Inst.C.E., and Mr. W. G. Bradshaw, C.B.E., was proposed by Mr. PADDON and seconded by Mr. C. P. CROOKENDEN, F.C.A., and carried.

Both Mr. JONES and Mr. BRADSHAW briefly responded.

Re-Election of Auditors.

Mr. C. H. RUTTER proposed, and Mr. BISGOOD seconded:

> "That Mr. B. Dennett Holroyd, F.C.A., and Mr. D. M. Touche, F.C.A., be re-elected Auditors of the Company at the same remuneration as last year."

The resolution was carried.

Vote of Thanks to Staff.

The CHAIRMAN proposed:

> "That the best thanks of this meeting be given to the staff of the Company in London and abroad for their services during the past year."

Thanks were due, he said, to everybody, from the Managing Director down to the most recently joined employee either in France or in London. There had been very great changes in recent years in the whole of the European Gas Company's staff, and the undertaking was managed most ably and con-

scientiously. The local Directors at the individual stations had been extremely loyal in carrying on the undertakings.

The resolution was seconded by Mr. S. H. Le Roy-Lewis, and carried.

Mr. F. Eliot Williams, O.B.E. (Managing Director), responded.

Vote of Thanks to Chairman and Directors.

Mr. Swanson, proposing a hearty vote of thanks to the Chairman and his co-Directors for their conduct of the Company's affairs during the past year, said that perhaps it was not fully appreciated that in addition to the normal commercial and technical administration of the Company, the Board had to act to a small extent as international financiers, and in their dealings with the French authorities they must exercise the tact and discretion of ambassadors. The Company was fortunate in having a Board sufficiently versatile to carry out all these functions with such success.

The resolution was seconded by Mr. Bisgood and carried.

The Chairman, in his response, said the work was interesting but certainly difficult; there were on the Board gentlemen peculiarly able to deal with the many difficult problems that arose.

British Gas Light Company, Ltd.

The Two Hundred and Fourth Ordinary General Meeting of the British Gas Light Company, Ltd., was held on Wednesday, March 20, at the Chief Office of the Company, 2, The Abbey Garden, Westminster, S.W. 1—Mr. Henry Woodall, M.Inst.C.E. (Chairman and Managing Director), presiding.

The Secretary (Mr. A. J. Mumford) read the notice convening the meeting, together with the reports of the Auditors. The Directors' Report and Statement of Accounts for the year ended Dec. 31, 1934, were taken as read.

THE CHAIRMAN'S ADDRESS.

The Chairman said: One of our Directors, Lord Mersey, writes me to say how much he regrets not being present here to-day. He has been appointed Chairman of a Parliamentary Joint Select Committee of Lords and Commons to deal with Scottish Private Bills, and he is now in Scotland on this important business.

This is our 204th Ordinary General Meeting; until recently we had half-yearly meetings, and the Company has been in existence for 111 years.

You have all received copies of the accounts, and I think you will agree they are satisfactory. Last year was a very poor one for dispensers of heat; December, the month in which we have our largest output, was the warmest December on record. In spite of this, the net reduction in our sale of gas was less than 1%. We supply 33 towns and villages, and of these you will be interested to know 20 showed increases, and 13 decreases. Unfortunately, one of the stations that had a decrease was our largest, Hull, and so the total output, as I said before, is slightly down.

The accounts call for little special comment. No capital has been raised during the year. We were able to obtain a reduction in the interest on the second issue of Trowbridge debentures, £10,417, from 5¾% to 4¼%. The £29,500 Norwich debentures fell due for redemption, and were re-issued on March 1 this year at 4% interest as against 6%.

The result of the year's working is that we are able to pay our usual dividend of 7½%, add £10,000 to the general reserve fund, making that fund £170,000, and increase the carry forward, which now stands at £88,161, by £142. I must, however, point out that this result was only obtained by reducing the Reserve Fund at Hull by £26,683. It is important to understand the difference between Station Reserve Funds and the General Reserve Fund.

The profits the Company takes from its statutory stations are limited by the various Acts of Parliament governing those stations, and any amounts earned above the statutory limits must be carried to the Station Reserve Funds, ready to meet deficiencies which may arise in subsequent years. These Reserve Funds therefore perform the useful purpose of stabilizing the profits of the Company, and also the price of gas. They are quite distinct from the General Reserve Fund, which has been accumulated from the profits of the Company, and which might have been distributed as dividends. Our General Reserve Fund has steadily grown, but the Reserve Funds at our various stations fluctuate. In 1921 there was no Reserve Fund at Hull, but in 1928 we had accumulated the maximum Reserve Fund allowed. We then had to reduce the price of gas, and made perhaps too drastic reductions, with the result that we had to call upon the Station Reserve Fund which now stands at £35,159. At Norwich, on the other hand, there was no Reserve Fund in 1930, but to-day it stands at £22,720, accumulated in the last four years. Your Directors have announced a small increase in the price of gas at Hull, and it is hoped before long we shall again add to the Reserve Fund there.

Operations at Hull.

As I am speaking of Hull, you will be interested to know that we have recently acquired the mains and meters in the Old Town from the Hull Corporation, who purchased the undertaking in 1897 from the Kingston-upon-Hull Gas Light Company; under the provisions of the Act, the Corporation demolished the Gas-Works and purchased gas in bulk from us, which they distributed. We now have control of the district, and are able to deal direct with the consumers. After most pleasant but somewhat prolonged negotiations with the Corporation we are very glad to have this matter satisfactorily settled. Hull is our chief station, and you will be sorry to hear that our Chief Engineer, Mr. Harold E. Copp, who has not enjoyed the best of health for some time past, asked to be allowed to relinquish his duties in September last. His place has been taken by Mr. C. R. Armitage, who has done good work for us at Norwich and elsewhere.

The Company, as you know, is a limited liability company, owning statutory undertakings, also others which are non-statutory. The total number of gas undertakings we control is 31, of which 14 are statutory and 17 non-statutory; we also control one statutory water undertaking and one separate chemical works. Our business is an old-established and a varied one; we operate works of all sizes; our largest has had an output of over 2,000 million c.ft. per annum and our smallest just under 3 million c.ft., and all of them pay.

Many of the undertakings we have acquired were in a poor condition, due generally to want of capital to enable modern plant to be installed and pay for expert advice. We are able to supply any necessary capital and also provide a staff of engineers, chemists, accountants, and salesmen, whose services are always obtainable when required. Our extensive experience has shown that gas undertakings, large or small, in all parts of the country, can hold their own and extend under proper conditions; and it also proves the wisdom and necessity of grouping together small and large units. In some cases, comparatively few, we have been able to connect up towns and villages, and discontinue manufacture at the less economical works. The cost of main-laying in country districts is, however, often very heavy, and anything like a gas grid, other than in exceptional cases, holds out little hope of decrease in cost.

I referred earlier to the fact that 13 of our undertakings showed a decrease; this is largely due to the introduction of electricity. When electricity is first introduced there is an inevitable reduction in the gas output; but we find that in a few years the amount of business lost is regained, partly because some people revert to gas, and partly by the normal growth of building and population. You will realize that the price of gas varies very considerably in our undertakings; the lowest price we charge, that is, the price to ordinary consumers, is 7d. per therm, and the highest, I regret to say, is 18d. per therm. But in nearly all cases we increase our business and satisfy our consumers. The reason is that we endeavour to supply a good article and see that the consumer has the best available apparatus, and that it is kept in good order; this is done by having a competent staff, always available to meet and put right any trouble that may occur.

First-Class Technical Control.

I have told you rather a long story, but I want you to realize that our Company, which has I believe a longer experience than any other of the advantage of grouping and amalgamation, is able to say with confidence that the Gas Industry is progressive, and increasingly successful, and that what is wanted is first-class technical control. Price of gas is of very great importance, but more important still is a thoroughly good and regular supply. To convince you further of the sound and progressive character of the Gas Industry I will give you a few figures. In our various areas of supply 4,263 new houses were erected and occupied in the year 1934; the following is a list of the apparatus installed in these houses:

Lighting points	1,367
Cookers	3,173
Gas fires	265
Wash boilers	2,392
Water heaters	417
Other appliances	477
Total	8,091

These figures refer only to new houses. The output of appliances has been larger than ever this year, and in Hull alone 14,510 pieces of apparatus were sold and fixed. Another instance, I think, is worth recording—namely, the result in connection with a new Corporation Housing Estate. The Great Yarmouth Corporation have been re-housing people from the Yarmouth area in Gorleston, which is part of Great Yarmouth, but supplied by our Gorleston and Southtown undertaking.

The Corporation is an enlightened one, and agreed that the Company should be allowed to pipe the houses, and they themselves wired them for electricity. The tenants were then given a free choice of what they should use, gas or electricity. Up to date 107 houses have been occupied—

The number using gas for all purposes is 78 (45 of those, however, have electric light in some of their rooms).
The number using electricity for all purposes is 20.
The number declining to use either gas or electricity is 9.

You are aware that most of our gas is sold to small consumers, and you will understand how satisfactory it is to know that intelligent people, when given freedom of choice, by a large majority, choose gas to do the bulk of their lighting, heating, and cooking.

I have had statistics (available since 1864) taken out, and the following figures in connection with Hull may interest you:

—	Gas Sold. Million C.Ft.	Price of Coal per Ton Delivered.	Average Weekly Wages (Stokers, Labourers, Lamplighters, &c.).	Price of Gas per 1,000 C.Ft.
		s. d.	£ s. d.	s. d.
1864 . . .	120	9 0	1 3 0	4 0
1934 . . .	2,000	19 3	3 0 0	2 8·2

These figures speak well for the progressive character of gas-works practice and results. The output has increased 16 times; the price of coal is more than doubled; wages are nearly trebled; and the price of gas has decreased by about 33%. There are a number of reasons for these results, the two chief being a very large increase in business, and the fact that we obtain from a ton of coal nearly twice the amount of gas we were able to do 70 years ago.

I am able to inform you that our works are in good condition, and the results generally improving. We hope to acquire more undertakings, but we have now competitors in the field. Last year we sold one small works with an output of just over 3 million c.ft. per annum, and purchased another with an output of 76 million. We supply the best of heating agents, and if we make full use of our growing opportunities as I am sure we are doing, we have no cause to fear the future.

In conclusion, I should like to thank our most excellent staff of willing and enthusiastic workers, to whom we realize much of the success of our Company is due.

I have now much pleasure in proposing the adoption of the report and accounts.

The DEPUTY-CHAIRMAN (Mr. Harold G. Palmer) formally seconded.

The motion for the adoption of the report and accounts was then put to the meeting and carried unanimously.

Dividends.

The CHAIRMAN then moved that the payment of the dividends at the rate of 7% per annum, less income-tax, on the cumulative preference stock and 5½% per annum, less income-tax, on the "B" redeemable cumulative preference stock as mentioned in their report of March 11, 1935, be confirmed.

This was seconded by the DEPUTY-CHAIRMAN and carried.

The CHAIRMAN next moved that the payment by the Directors of the interim dividend at the rate of 3½%, less income-tax, on the ordinary stock as mentioned in their report of March 11, 1935, be confirmed and that a final dividend on the ordinary stock at the rate of 4%, less income-tax, making 7½% for the year, less income-tax, be now declared, the same to be payable on April 5 next, and that the dividend warrants be sent by post to the last known address of each proprietor unless instructions have been received to the contrary.

This was also seconded by the DEPUTY-CHAIRMAN and carried unanimously.

Re-Election of Directors.

The CHAIRMAN moved the re-election of Mr. A. W. Brookes as a Director of the Company, remarking that Mr. Brookes entered the Company's service as long ago as 1878. Indeed, it would seem almost impossible, he said, to have a British Gas Light Company without Mr. Brookes, who had done extraordinarily good service for the Undertaking for so many years. He was appointed a Director in 1929, and the Board regarded it as a very great advantage to have a gentleman of such knowledge and experience of the way in which the business of the Company had been carried on. The Board would be very sorry to lose the services of Mr. Brookes, and he had the greatest pleasure in proposing his re-election as a Director of the Company.

The DEPUTY-CHAIRMAN seconded the proposition, which was carried unanimously.

Mr. A. W. BROOKES expressed his thanks for his re-election to the Board and said he was proud to retain that honour.

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The CHAIRMAN then moved the re-election of Mr. Graham Wilkin, who he said was originally appointed a Director in 1925 and whose family had been connected with the Company since its inception. Pointing to a framed copy of a resolution on the wall of the room, the Chairman said that the two Wilkins mentioned there—father and son—had served the Company for 50 years each, and that a combined period of 100 years must surely be a record for a father and son on any Directorate. Now they had Mr. Graham Wilkin representing the family on the Board, and he expressed the personal hope that there would be a Wilkin on the Board of the Company for a very long time.

The DEPUTY-CHAIRMAN seconded, and the resolution was carried unanimously.

Re-Election of Auditors.

On the motion of Mr. S. O. STEPHENSON, seconded by Mr. KENNETH R. MACKAY, the Auditors, Mr. E. Knowles Corrie and Mr. William Cash, Jr., F.C.A., were re-elected Auditors of the Company.

Votes of Thanks.

Lieut.-Col. H. W. WOODALL, proposing a vote of thanks to the Chairman and Directors, said that after listening to the very encouraging remarks made by the Chairman concerning the position of the Company, the proprietors would desire to express their thanks and gratitude for the wonderful results shown, which were not the outcome of mere fortuitous circumstances. The old idea that the Gas Industry had a monopoly vanished many years ago, and it was only by very able administration that the Gas Industry was able to go on and show improving results year by year, such as the British Gas Light Company had always been able to do. It was to be hoped, therefore, that the Directors would long be spared to continue to control the affairs of the Company in the admirable manner they had done hitherto.

Sir PAUL A. MAKINS seconded the vote of thanks, which was carried with hearty acclamation.

The CHAIRMAN, in acknowledgment, said it was always a very great pleasure to serve the Company, and the Directors really did put in a great deal of time in the interests of the proprietors. They owned a large number of undertakings, which meant that the Directors were fairly busy people, because it was not possible to visit 33 different undertakings in the course of a year without giving up a great deal of time to the work. The aim of the Board was always to see that the small works were maintained in as good condition as the larger ones, and that, in his view, was the reason for the success of the Company as a whole. The Directors felt very much encouraged by the vote of thanks and would do their best to serve the Company well in the future.

The Chairman went on to propose a hearty vote of thanks to the Secretary and officers of the Company and also to the staffs and workmen, remarking that it was perfectly well understood that without an excellent staff and satisfied workmen it would be impossible to achieve the results which had been put before the proprietors on the present occasion. There were very good arrangements in the Company for the comfort of the workpeople; and there was an excellent Pensions Scheme which gave the greatest possible satisfaction both to the staffs and employees generally. At the present time there was a great deal of mechanization of works, and it was rather sad to have to dispense with the services of workpeople occasionally. The Pensions Scheme helped to ease matters, however, as it afforded provision for old employees whose services were no longer required. This had helped to make the operation of the Company much more pleasant than it had sometimes been in the past when nothing of the sort was available. Once more he expressed the appreciation of the Directors and proprietors of the excellent work done by all the employees of the Company throughout the year.

Capt. W. J. LIBERTY seconded the vote of thanks, which was carried with acclamation.

The SECRETARY, acknowledging the vote of thanks on behalf of the staff and employees, said that they would all be gratified to have this recognition of their efforts during the past year. At the same time, he knew they would wish him to take this opportunity of expressing their very keen appreciation of the consideration and encouragement they always received at the hands of the Board. Enthusiasm, ability, and the will to work could not alone achieve the best results. It was necessary to have, in addition, goodwill and confidence in the leadership, and in all these respects the staffs and employees of the Company considered themselves particularly fortunate. Moreover, they were deeply sensible of the very keen personal interest which the Directors took in their welfare, not only during the years they were actively employed with the Company, but in the later years after they had reached the age of retirement. Therefore, on behalf of the staff and employees he expressed thanks to the meeting, and said he would have pleasure in conveying the terms of this resolution to them.

The meeting then terminated.

THE
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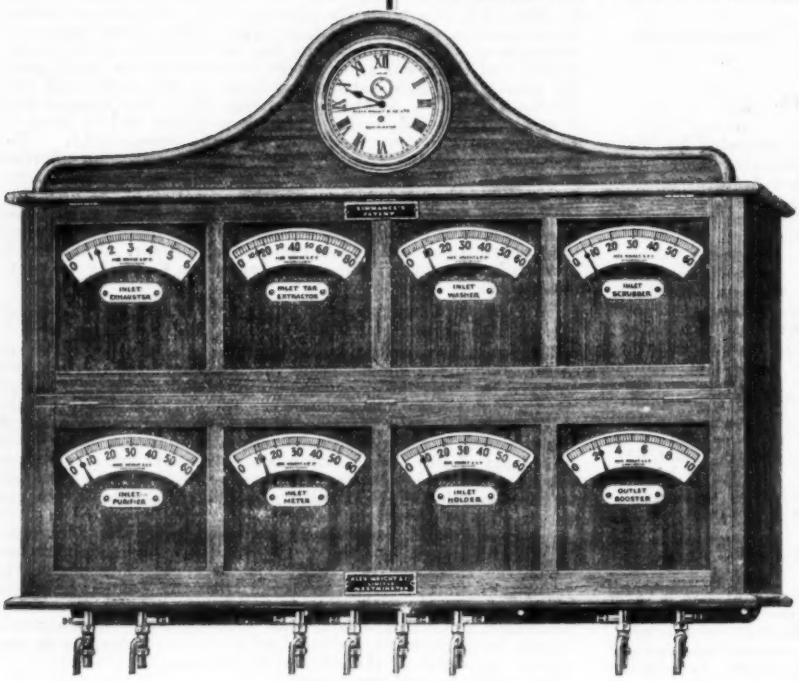

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Gas Markets and Manufactures

Stock Market Report

(For Stock and Share List, see later page)

European politics and the uncertainty over the future led to a somewhat severe curtailment of business on the Stock Exchange last week, and the recovery which began to show itself the previous week soon collapsed. Prices were marked down in nearly all sections, not, however, in any "panicky" fashion, for the movements did not attain really serious dimensions. The full brunt of the shock was felt in the gilt-edged and foreign bond markets, and, though large sums are awaiting investment in the former, buyers will naturally hold off until the result of the political events of the current week become known. It was apparent at the close on Friday that markets are ripe for a quick recovery on the receipt of better news.

The general outlook was to some extent reflected in the Gas Market, where the volume of business was smaller than usual. A few quotations were marked down, and, as was the case last week, these included several which had not recently depreciated and so have now been reduced to the general level. On the other hand, the market was not without rises, for three stocks recorded increases on the week—viz., Mid-Southern 4% preference, Sheffield 4% debenture (on the local Exchange), and Southampton 5% maximum.

The recent reactions have chiefly affected ordinary stocks, and it is interesting to note that despite the sharp falls the majority of these still stand at higher prices than a year ago. Preference and debenture stocks have suffered very little, and many are now quoted anything up to 10 points higher over the same period. The following list of ordinary stocks illustrates the position:

—	Quotations.		Rise + or Fall −
	1934. March 24.	1935. March 22.	
Alliance and Dublin	130—140	128—138	− 2
Bournemouth 7%	162—167	167—172	+ 5
Brighton 5% Cons.	149—154	153—158	+ 4
Bristol 5% Max.	115—116	118—119	+ 3
Cardiff	126—131	130—135	+ 4
Commercial	120—125	114—119*a*	− 6
Croydon sliding scale	151—156	155—160	+ 4
Gas Light units	25/6—26 6	25/3—26/3	− -/3
Imperial Continental	205—210	200—210	− 2½
Liverpool	129½—131½	134—138	+ 5½
Newcastle units	25/6—26/-	24/-—25/-	− 1/3
Portsmouth 4%	168—173	180—185*b*	+12
Sheffield	135—137	144—146	+ 9
South Metropolitan	131—134	122—127*a*	− 8
South Suburban	129—134	130—140	+ 3½
Southampton	109—114	114—119	+ 5
Tottenham	148—153	150—155	+ 2
Wandsworth	155—160	156—161	+ 1

a Dividend for 1934 reduced by ½ p.ct.
b Dividend for 1934 increased by ½ p.ct.

Current Sales of Gas Products

The London Market for Tar Products.

LONDON, *March* 25.

There are no changes to report in the prices of tar products, which remain as follows:

Pitch, 40s. to 42s. 6d. per ton f.o.b.

Creosote, 5½d. to 5¾d.

Refined tar, 4d. per gallon in bulk at makers' works.

Pure toluole, 2s. 1d. to 2s. 8d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, 1s. 5d.; and 90/160 pyridine, about 5s. 9d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

March 25.

The average prices of gas-works products during the week were: Gas-works tar, 20s. to 25s. Pitch—East Coast, 40s. to 41s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 40s. to 41s. 6d.* Toluole, naked, North, 1s. 8d. to 1s. 9d. Coal-tar crude naphtha, in bulk, North, 6½d. to 6¾d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 4¾d. Heavy naphtha, North, 9¾d. to 10¾d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅝d. to 4½d.; low gravity, 4⅝d. to 4½d.; Scotland, 4⅝d. to 4½d. Heavy oils, in bulk, North, 4d. to 4¼d. Carbolic acid, 60's, 1s. 9d. to 1s. 10d. Naphthalene, £10 to £11. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *March* 23.

New business is not plentiful, but prices of most products are maintained at previous levels.

Crude gas-works tar.—Actual value remains at 29s. to 31s. per ton *ex* works in bulk.

Pitch.—Value is purely nominal at 40s. to 42s. per ton f.o.b. Glasgow for export and 40s. per ton *ex* works in bulk for home trade.

Refined tar is commanding 3d. to 3½d. per gallon f.o.r. naked. Many County schedules are now issued.

Creosote oil.— Business is confined to comparatively small quantities. B.E.S.A. Specification, 4⅞d. to 5⅛d. per gallon; low gravity, 4⅞d. to 5⅛d. per gallon; and neutral oil, 4¾d. to 5d. per gallon; all f.o.r. in bulk.

Cresylic acid is in slightly better call, but quotations are unchanged. Pale, 97/99%, 1s. 3d. to 1s. 4d. per gallon; dark, 97/99%, 1s. 1d. to 1s. 2d. per gallon; and pale, 99/100%, 1s. 4d. to 1s. 5d. per gallon; all *ex* works.

Crude naphtha is only available in small quantities at 4¼d. to 4¾d. per gallon, according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 3d. to 1s. 4d. per gallon, and 90/190 heavy is 10d. to 11d. per gallon.

Motor benzole is valued at 1s. 2½d. to 1s. 3½d. per gallon in bulk *ex* works, but orders are scarce.

Pyridines.—90/160 grade is 5s. 6d. to 6s. per gallon, and 90/140 grade 6s. to 6s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole	0	8½	to	0	9	per gallon at works
Motor ,,	1	2	,,	1	2½	,, ,, ,,
90% ,,	1	3	,,	1	3½	,, ,, ,,
Pure ,,	1	6½	,,	1	7	,, ,, ,,

Contracts Advertised To-Day

Coal.
Gainsborough Gas Department. [p. 777.]
Severn Valley Gas Corporation. [p. 777.]
Walsall Gas Department. [p. 778.]

Condensers.
Belfast Gas Department. [p. 777.]

Main Laying.
Northallerton Consumers Gas Company, Ltd. [p. 778.]

Pipes.
Clacton Gas and Water Department. [p. 777.]
Northallerton Consumers Gas Company, Ltd. [p. 778.]

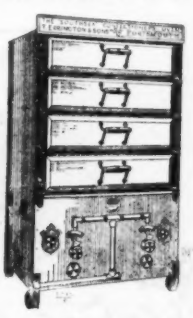
Reinforced Concrete Construction.
Smethwick Gas Committee. [p. 777.]

Retorts.
Keighley Gas Department. [p. 777.]

Trade Notes

The "Southsea" Portable Gas Oven.

An interesting feature of the "Southsea" portable gas oven, manufactured by Messrs. T. Errington & Sons, of Southsea Works, Cottage Grove, Portsmouth, is the patent non-backfire gas cock and air regulator, whereby the makers claim that it is impossible for the burner to backfire as the air supply is turned



down at the same time as the gas. Each shelf of this oven has an independent door which drops to a horizontal position when open. The oven is made of a stout double casing of galvanized steel, well packed with insulating material, thus reducing loss of heat by radiation to a minimum.

Whatever the size of works, the best modern practice is represented by

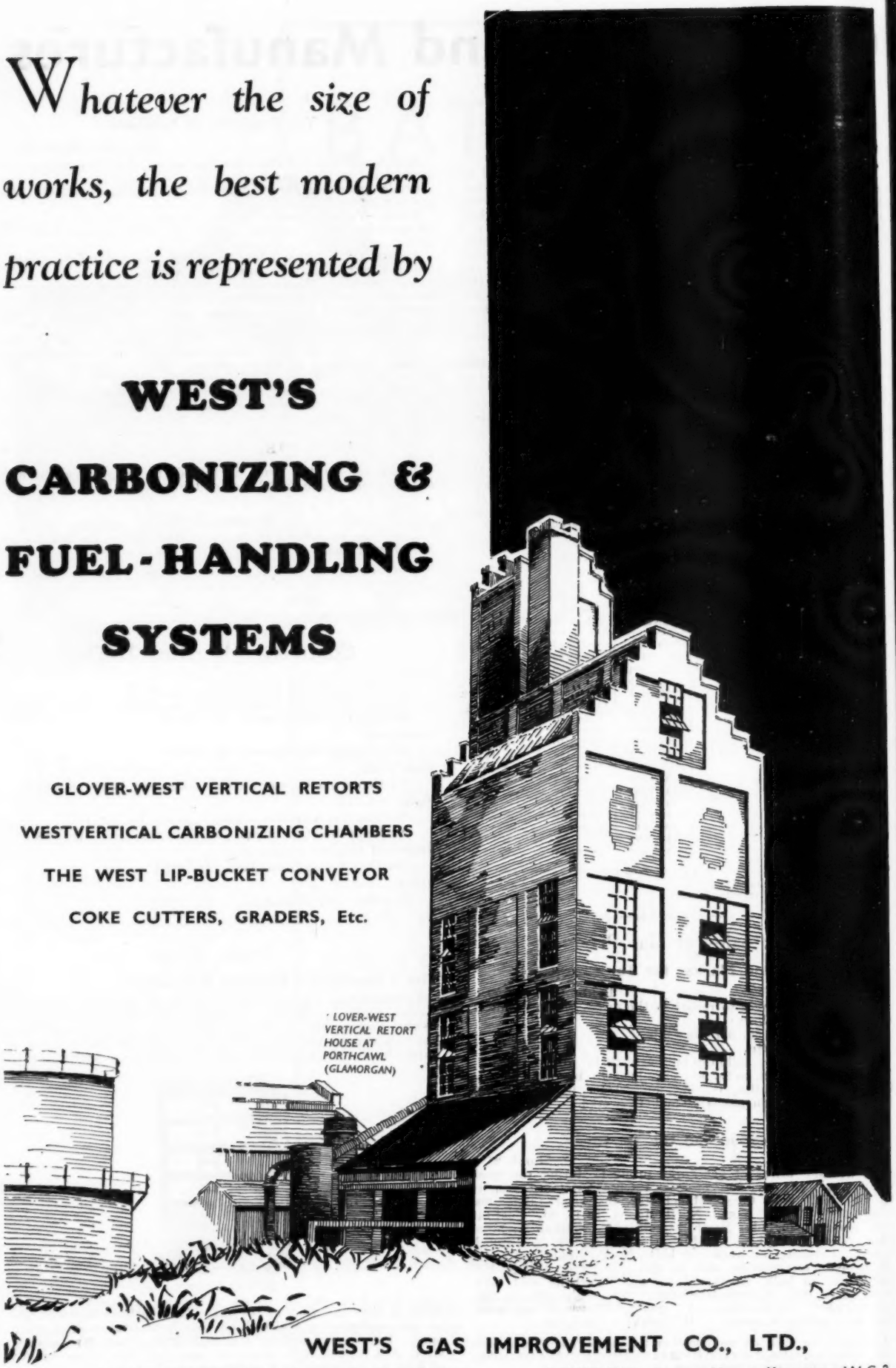
WEST'S CARBONIZING & FUEL-HANDLING SYSTEMS

GLOVER-WEST VERTICAL RETORTS

WESTVERTICAL CARBONIZING CHAMBERS

THE WEST LIP-BUCKET CONVEYOR

COKE CUTTERS, GRADERS, Etc.



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STOCK AND SHARE LIST

Official Quotations on the London and Provincial Stock Exchanges

Issue. £	Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, March 22.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,551,868	Stk.	Mar. 11	7	7	Alliance & Dublin Ord. ...	128—138*	−4	...
374,000	,,	Dec. 17	4	4	Do. 4 p.c. Deb. ...	90—100	...	...
557,655	,,	Feb. 18	7	7	Barnet Ord. 7 p.c.	167—172	...	...
300,000	1	Oct. 8	1.9⅜	1/4½	Bombay, Ltd.	30/—32/-	...	29/6
178,480	Stk.	Feb. 18	9½	9½	Bournemouth sliding scale ...	220—230	...	...
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	167—172	...	165—168
439,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	147—152	...	149
50,000	,,	Dec. 17	3	3	Do. 3 p.c. Deb. ...	86—91	...	..
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	104—109	...	..
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	127—132	...	...
357,900	,,	Feb. 18	7½	7½	Brighton, &c., 6 p.c. Con. ...	170—180	−4½	...
649,955	,,	,,	6½	6½	Do. 5 p.c. Con. ...	153—158	−6	...
205,500	,,	,,	6	6	Do. 6 p.c. B. Pref.	145—150	...	148½—150
1,487,500	,,	Feb. 4	5	5	Bristol, 5 p.c. max.	118—119*a*	−1	..
120,420	,,	Dec. 17	4	4	Do. 1st 4 p.c. Deb. ...	102—104*a*	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	102—104*a*	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	122—124*a*	...	...
855,000	,,	Mar. 11	7	8	British Ord.	157—167*	−5½	163—167
100,000	,,	Dec. 17	7	7	Do. 7 p.c. Pref.	160—165	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	97—102	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	111—116	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	Dec. 17	4½	4½	Do. 4½ p.c. Deb. ...	88—93	...	...
626,860	,,	Jan. 21	6	6	Cardiff Con. Ord.	130—135	...	...
237,860	,,	Dec. 17	5	5	Do. 5 p.c. Red. Deb.	105—110	...	...
157,150	,,	Feb. 4	5	6½	Chester 5 p.c. Ord.	111—116*b*	...	...
98,936	1	Sept. 24	2/-	2/-	Colombo, Ltd., Ord.	1⅝—1⅞	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	21/—23/-	...	...
609,204	1	Sept. 24	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	20/6—22/6	...	...
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	25/—27/-	...	...
1,775,005	Stk.	Feb. 4	5	6	Commercial Ord.	114—119	−1	114—115
475,000	,,	Dec. 3	3	3	Do. 3 p.c. Deb. ...	85—90	...	85—87
286,344	,,	Feb. 18	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
807,560	,,	Feb. 18	7	7	Croydon sliding scale... ...	155—160	...	158½
569,590	,,	,,	5	5	Do. max. div.	113—118	...	115—115½
620,385	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	128—133	...	...
542,270	,,	Feb. 18	7	10	Derby Con.	190—200*c*	...	...
55,000	,,	Dec. 17	4	4	Do. 4 p.c. Deb.	100—105*c*	...	...
239,000	,,	Feb. 4	5	5	East Hull Ord. 5 p.c....	111—116	...	...
181,625	,,	Feb. 4	6	6	East Surrey Ord 5 p.c. ...	131—136	...	...
175,609	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	120—125	...	120
1,002,180	,,	Mar. 11	†5	†7	European, Ltd.	111—116*	−2	113—116
19,313,481	,,	Feb. 4	5½	5½	Gas Light & Coke 4 p.c. Ord.	25 3—26 3*f*	...	25 11—25 7½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	86—91	...	88½—88⅜
4,477 106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	104—109	...	105—107½
6,102,497	,,	Dec. 3	3	3	Do. 3 p.c. Con. Deb. ...	87—92	...	89—91
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	115—120	...	...
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	113—118	...	114—115
270,466	,,	Feb. 18	6	6	Harrogate New Cons. ...	135—140	...	...
140,000	1	Sept. 24	1/7½	1/7½	Hongkong & China, Ltd. ...	1⅝—1⅞	...	27/9—28/-
213,200	Stk.	Feb. 18	6	6	Hornsey Con. 3½ p.c....	128—138	...	...
5,600,000	,,	Oct. 22	14	10	Imperial Continental Cap. ...	200—210	−7½	200—213
223,130	,,	Jan. 21	3½	3½	Do. 3½ p.c. Red. Debs.	91—96	...	...
285,242	,,	Feb. 18	8½	8½	Lea Bridge 5 p.c. Ord. ...	172—182	...	...
2,167,410	,,	Feb. 18	6	6	Liverpool 5 p.c. Ord....	134—138*b*	−2	...
245,500	,,	Dec. 17	5	5	Do. 5 p.c. Red. Pref. ...	105—110*b*	...	...
306,083	,,	Jan. 16	4	4	Do. 4 p.c. Deb. ...	104—107*b*	...	...
165,736	,,	Feb. 18	8	10	Maidstone 5 p.c. Cap. ...	185—195	...	...
63,480	,,	Dec. 17	3	3	Do. 3 p.c. Deb. ...	83—88	...	...
75,000	,,	Dec. 3	†10	†10	Malta & Mediterranean ...	205—215	...	...
392,000	—	Oct. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	102—107	...	...
231,978	Stk.	Feb. 4	5	5	M. S. Utility "C" Cons. ...	110—115	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	102—107	+1	...
360,075	,,	Dec. 17	4	4	Do. 4 p.c. Deb. ...	102—107	...	104½—106
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	125—130	...	...
125,000	—	Jan. 2	11/8	3½	Do. 3½ p.c. Rd. Rg. Bds.	98—101	...	...
675,000	,,	May 28	†6	†3	Montevideo, Ltd.	55—65	...	...
2,061,315	,,	Feb. 18	5	5½	Newcastle & Gateshead Con.	24 —25½-*df*	−/6	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	106—107*d*	...	...
776,706	,,	Dec. 17	3½	3½	Do. 3½ p.c. Deb. ...	101½—102½*d*	...	...
277,285	,,	Oct. 8	5	5	Do. 5 p.c. Deb. '43 ...	105—107*d*	...	...
274,000	,,	Feb. 4	5	5	Newport (Mon.) 5 p.c. max....	108—110*a*	...	...
225,000	,,	Feb. 18	7½	7½	North Middlesex 6 p.c. Con.	172—177	...	...
396,160	,,	Feb. 4	5	5	Northampton 5 p.c. max. ...	105—110	...	106½
300,000	,,	Nov. 5	†7	†9	Oriental, Ltd.	170—175	...	...
416,617	,,	Dec. 17	8	8	Plym'th & Stonehouse 5 p.c.	178—183	...	...
504,416	,,	Feb. 4	8	8½	Portsm'th Con. Stk. 4 p.c. Std.	180—185	...	180—183
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	110—115	...	...
114,000	,,	Jan. 21	5	5	Preston 5 p.c. Pref.	108—113	...	...
1,736,968	Stk.	Feb. 18	6	6	Sheffield Cons.	144—146*e*	...	...
95,000	,,	Jan. 7	4	4	Do. 4 p.c. Deb.	103—106*e*	+2½	...
133,201	,,	Feb. 18	8½	5	Shrewsbury 5 p.c. Ord. ...	145—150	...	...
90,000	10	May 28	†4	†3	South African	3—4	...	...
1,061,779	1	Sept. 10	1/2½	1/2½	South East'n Gas Cn. Ld. Ord.	27/6—29/6	...	...
845,016	1	Mar. 11	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	22/—23/-*	...	22/6
450,000	Stk.	Feb. 4	7¼/4	4	Do. 4 p.c. Red. Deb. ...	100—103	...	...
6,709,895	,,	Feb. 4	5	6½	South Met. Ord.	122—127	...	124—126½
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	147—152	...	148—149
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	104—109	...	...
1,895,445	,,	Dec. 17	3	3	Do. 3 p.c. Deb. ...	86—91	...	87½
1,000,000	,,	Jan. 7	5	5	Do. 5 p.c. Red. Deb....	113—118	...	116½
209,820	,,	Feb. 18	8½	8½	South Shields Con.	174—176*d*	...	...
1,543,795	,,	Feb. 18	6	6	South Suburban Ord 5 p.c. ...	130—140	...	...
512,825	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	123½—124½
500,000	,,	,,	4	4	Do. 4 p.c. Pref. ...	102—107	...	...
888,587	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	128—133	...	128—130
250,000	,,	,,	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
647,740	,,	Feb. 4	5	5	Southampt'n Ord. 5 p.c. max.	114—119	+1	118—118½
121,275	,,	Dec. 17	4	4	Do. 4 p.c. Deb.	102—107	...	...
350,000	,,	Feb. 4	5½	5½	Swansea 5½ p.c. Red. Pref. ...	113—118	...	...
200,000	,,	Dec. 17	6½	6½	Do. 6½ p.c. Red. Deb. ...	100—105	...	...
1,076,490	,,	Feb. 18	6½	6½	Tottenham and District Ord.	150—155	...	150—152
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	131—136	...	...
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
199,005	,,	Dec. 3	4	4	Do. 4 p.c. Deb. ...	103—108	...	105—107½
369,774	,,	Feb. 4	7	7	Uxbridge, &c., 5 p.c.	153—158	...	...
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
1,326,700	,,	Feb. 4	7	7	Wandsworth Consolidated ...	156—161	...	157—161
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126	...	125
1,317,964	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	127—132	...	129
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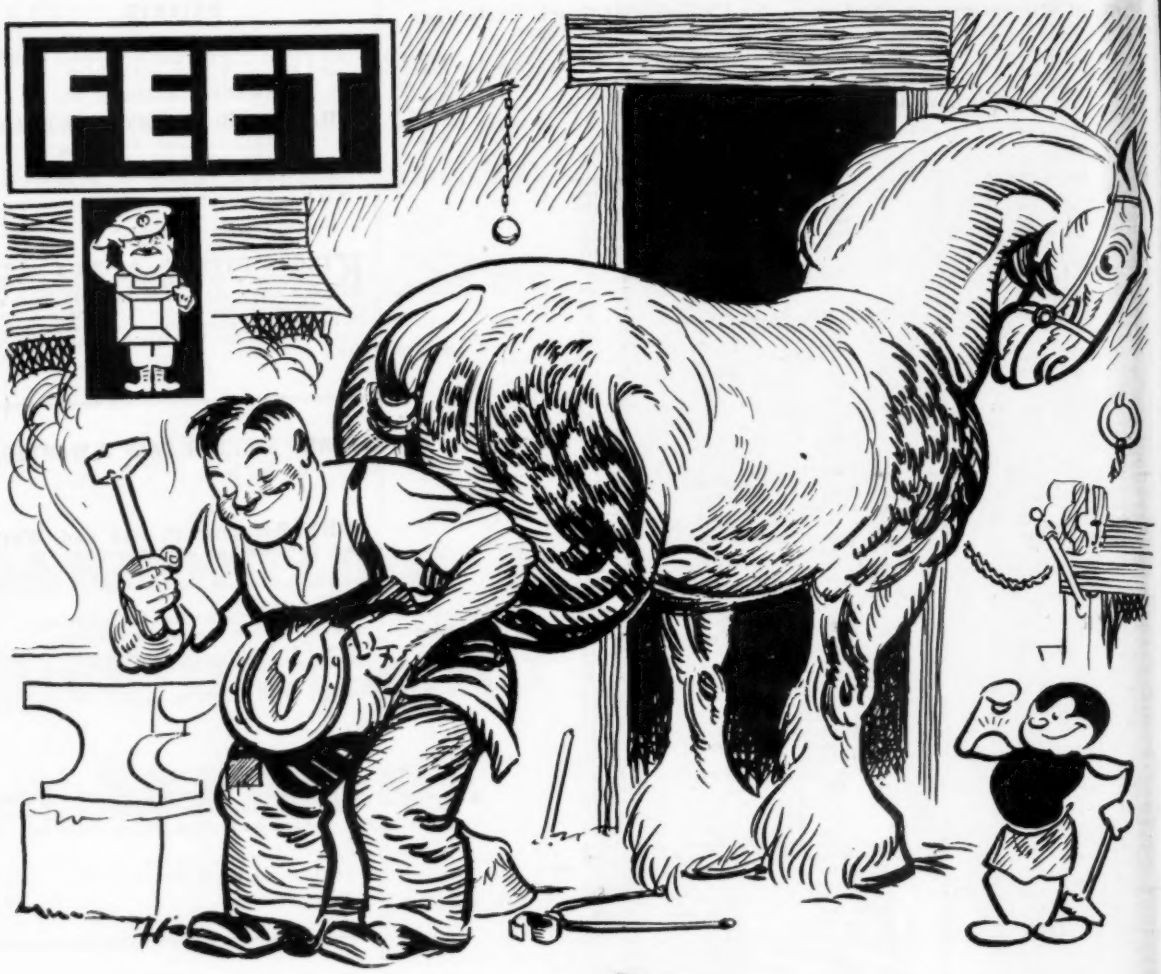

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